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A Monthly Review of Veterinary Science.

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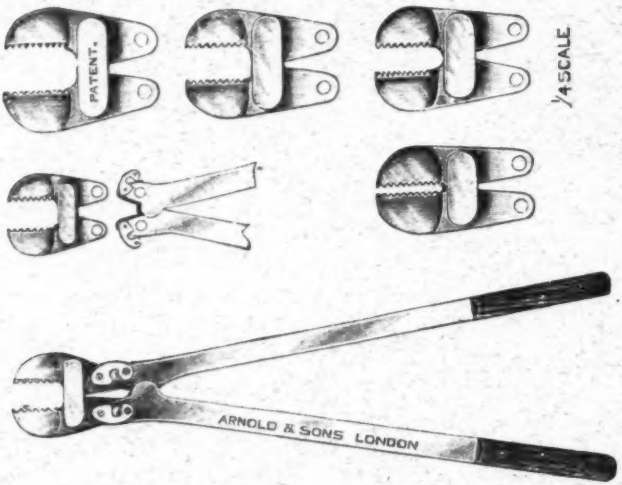

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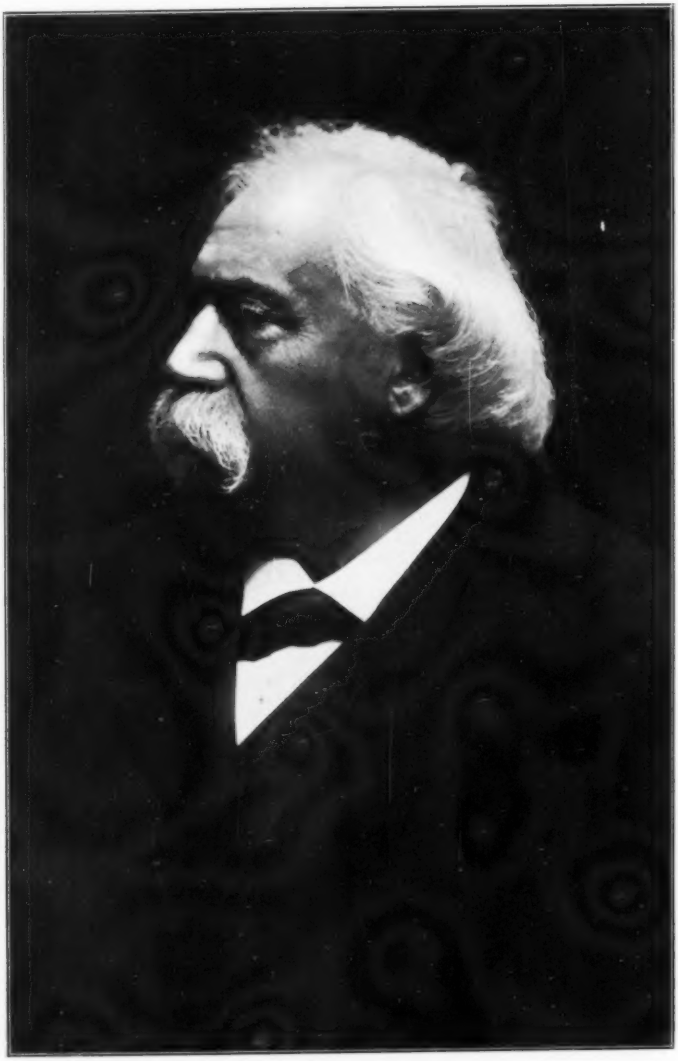

CHAUVEAU.

501

THE

VETERINARY JOURNAL

SEPTEMBER, 1912.

CHAUVEAU.

THE veterinary profession is honoured in counting Professor Chauveau among its members. He is universally known and respected. No one, in any age or any country, has done more for veterinary medicine than he. The highest distinctions have been earned by him, not only through his energy and his incomparable work and achievements, but through the worthiness of his life.

In 1848 he gained the diploma of the School of Alfort, and for sixty-four years his untiring ardour has never for an instant relaxed. A volume would be needed for the mere enumeration of his activities.

He first began to teach anatomy at the School of Lyons, and while he was there he wrote a "Treatise on the Anatomy of Domestic Animals," which was translated into every important language and which is still one of the principal guides of veterinarians all over the world.

He became interested in the study of physiology. At the School of Lyons he founded a model laboratory for investigating the manifestations of life, and he was one of the first to make use of recording apparatus, which he continually strove to improve.

He was one of the earliest exponents of the modern science of bacteriology. While this science was yet in its infancy he was aware of the functions of the infinitely small. He was more than a disciple of Pasteur's; he is entitled to share in the glory of the great inoculator.

Professor Chauveau's renown early attracted the attention of the Faculty of Medicine at Lyons, which body was fortunate in securing him as one of their professors—a position which he held for many years, during which time he was also Director of the Veterinary School in the same city.

In 1886, Professor Chauveau became Inspector-General of Veterinary Schools and also Professor of Comparative Pathology at the Natural History Museum of Paris. His labours were constantly pursued with the utmost vigour, and through his strenuous initiative the Museum laboratory produced some remarkable data, the best known of which are connected with muscular contraction and with the part played by sugar in nourishment.

The most eminent learned bodies are proud to have Professor Chauveau as a member. The Academy of Medicine listens with respect to the pronouncements of our illustrious *confrère*, and the Academy of Science has conferred on him the highly-coveted position of President. The Government of the Republic has honoured him in succession with all the distinctions in its gift and has crowned his career by appointing him Grand Officer of the Legion of Honour.

The life of Professor Chauveau constitutes an example for all. This great worker, who has ever been attracted towards his juniors, was particularly afflicted in recent years by the loss of his two most cherished pupils, Professors Arloing and Lautarie—two experts trained in his teaching.

Without exaggeration, it may truly be said of Chauveau, that surrounded by the respect of those who know him personally, as by those also who are only acquainted with his scientific accomplishments, he is the most distinguished veterinary personality in the world.

V. D.

Editorial.

THE NATIONAL VETERINARY ASSOCIATION AND HEREDITARY UNSOUNDNESS IN HORSES.

A GREAT step forward was made in veterinary politics when the Board of Agriculture appealed to the National Veterinary Association this year for their opinion concerning unsound conditions of stallions which should be regarded as transmissible to their progeny. Although the veterinary profession is undoubtedly the body best qualified to advise on this and kindred subjects, they have never, so far as we are aware, been approached in this manner before, and we appreciate the change very highly. In questions like the one under discussion it is a consensus of opinion, backed up by concrete examples, that is of importance, and not only the view of the individual. Such matters certainly do not come within the scope of the Council of the Royal College of Veterinary Surgeons, hence the National Veterinary Association was rightly approached by the Board. The members of the Association were circularized and questions were asked concerning each of the conditions now scheduled by the Board, namely: cataract, roaring, whistling, ringbone, sidebone, navicular disease, bone spavin, stringhalt, shivering, and defective genital organs. The replies that were sent in were very carefully tabulated by Mr. Brittlebank and Mr. Locke, of the small Committee appointed for the purpose. The result showed that the list was supported by an overwhelming majority. The majority in one instance, however, was not so marked as in the others, and that was with reference to cataract. The majority was there, however, and consequently the Association by resolution replied to the Board expressing approval of the scheduled list. This should certainly strengthen the hands of the Board of Agriculture in any steps they consider it wise to take with a view to improving the type of horses subsidized by them for breeding purposes.

But this reply of the Association does not solve the whole of the difficulties by any means, as was shown by a further question that was submitted concerning the Board's definition of ringbone, which is as follows: "This term includes articular or periarticular ring-

bone, or any bony growth that partly of completely surrounds the pastern at the coronary joint. It is not intended to be applied to well-defined isolated exostoses of the os coronæ or lower part of the os suffaginis, commonly known as 'knuckle-bone' or 'ankle bone.'" The Association considered that this definition required amending so as to include the so-called "low ringbone" which involves the pedal joint. As no reference was made to "ankle bone" in the reply, the Association evidently agrees with their omission from serious consideration. This is the view of Mr. Hunting, who presented an excellent paper on "Phalangeal Ostitis," and of others, but to some of us it does not appear quite logical, especially if the view be correct that the condition commenccs as ostitis with exostosis following as a consequence. If the ostitis is the hereditary condition, it seems of minor importance whether its first external manifestation involves a joint or appears along the shaft of the affected bone. Hence some of us are of opinion that it is a mistake to exempt ankle bones from serious consideration when the hereditary nature of the condition is being considered. It is an important point and can only be solved by very careful observations from which statistics could be compiled. Needless to say, the veterinary profession keenly appreciates the action of the Board of Agriculture, and considers it a very happy omen.

G. H. W.

Personal.

RHODESIA VETERINARY STAFF.

In connection with certain reconstruction which has taken place in the Veterinary Department of Rhodesia, necessary in view of the steadily increasing numbers of farmers and of their flocks and herds, Mr. Edmonds, of Bulawayo, has been appointed Assistant Chief Veterinary Surgeon as from January 1, 1912, whilst the Territory has been divided for administrative purposes into regions each in the charge of a District Veterinary Surgeon, respectively, Mr. Hooper Sharpe, at Bulawayo; Mr. Ferguson, at Gwelo; Mr. Chatterley, at Umtali, and Mr. Williams, at Salisbury.

General Articles.

AN AUSTRALIAN METHOD OF CASTING HORSES FOR OPERATION.

By GEO. C. McLENNAN, L.V.Sc.

Melbourne University Veterinary School.

THE great success attending the adoption of this method of casting horses for operation at the Melbourne University Veterinary School led me to think that a description of the gear and the method of applying it would not be out of place.

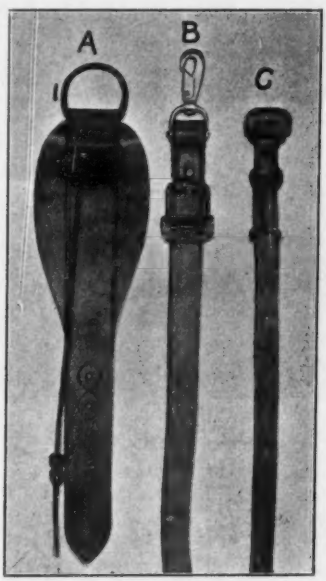

FIG. 1.—The Gear.

A. The hook strap with pin for fastening attached.
B. This strap is attached to A1 by means of the spring snap. The patent buckle upon which the efficiency of the gear depends is well shown.
C. This strap is used to suspend the fore leg in the manner described below.

I will first describe the apparatus, and then will endeavour, by the aid of figures, to explain its application.

A complete set of the gear has been sent to Messrs. Arnold and Son, of Giltspur Street, London.

Strap C, fig. 1, is passed over the withers from the near to the off side, so that the buckle end falls on the latter side. This end is fixed around the near fetlock by means of the snap and dee, the free end of the strap being passed through the buckle.

The leg is now raised by a pulling and lifting movement.

The hock strap (A, fig. 1) is now fixed by passing the small end through the dee and securing the pin.

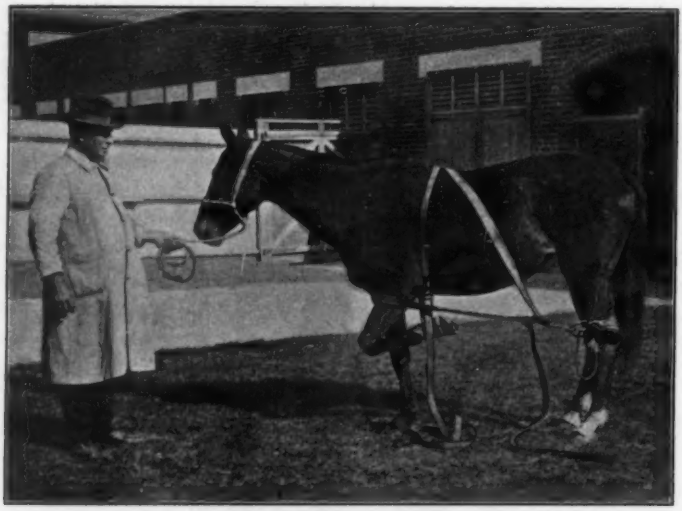

FIG. 2.

The Gear Applied.

Strap B, fig. 1, is next applied by passing the free end over the back, from the near to the off side, across the breast, taking care to keep it below the point of the shoulder, and through the buckle on the near side. The snap of the strap is now fixed on the dee (A1, fig. 1) of the hock strap.

The next step is illustrated by figs. 3 and 4.

The fore leg is now let down, and the halter rope is brought round the neck on the off side and thrown across the back so that the free end hangs on the near side.

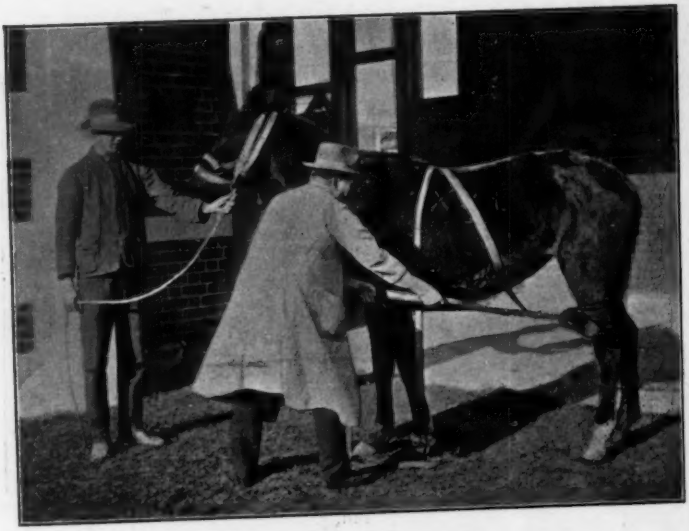

FIG. 3.

FIG. 4.

FIG. 5.

FIG. 6.

N.B.—1. The correct way of holding the head. 2. The splendid castration position.

The hind leg is now pulled well forward by one long pull. Immediately this is done the strap is dropped, the halter rope being grasped and the head pulled to the off, the operator at the same time moving backwards, thus making the animal assume a sitting posture. Continued traction on the halter rope makes the animal fall gently on its side. The halter rope is at once handed to an assistant, who keeps the head and neck fully extended, thus preventing the animal from rising.

We now have the horse on its side with the fixed leg undermost.

The next step is illustrated by fig. 5.

In order to prevent the animal from making too much use of his free hind leg he is rolled over and made to lie upon it.

To do this the fore leg is again pulled up.

The strap that was used to pull the hind leg forward is now passed under the fetlock of the same leg, and by traction on it the animal is made to roll over.

Note how the assistant moves in an opposite direction to the horse, thus keeping the head and neck well extended.

If necessary the hind leg can now be pulled further forward.

The horse cast ready for operation is shown in fig. 6.

To release the animal—(1) let the suspended fore leg down; (2) remove the pin from the hock strap.

The first attempts of the novice to use the gear will probably end in failure, but the knack and manual dexterity so essential for success will soon be acquired.

The many advantages gained by the use of this gear will counterbalance the time and trouble spent in learning its proper application.

My thanks are due to Farrier-Major Boreham, who supplied the material for the photographs.

THE OPERATIVE TREATMENT OF ROARING IN THE HORSE.—EXCISION OF THE LARYNGEAL VENTRICLES.

By Dr. R. EBERLEIN.

Rector of the Royal University Veterinary School, Berlin.

*(From the Surgical Clinique of the Royal Veterinary College in Berlin.)**

Roaring in horses is of remarkable economic significance. It is very widespread and has been observed in every breed of horse. Most frequently, however, it occurs in the English thoroughbred and its half-blood. Animals affected with the disease suffer considerably in working capacity and are, therefore, much depreciated in value. As breeding animals such horses are quite valueless, since breeders generally consider, although in most cases quite unjustly,† that the complaint is hereditary. According to the Imperial Order of March 27, 1899, concerning unsoundness and breach of warranty, roaring has been reckoned of great forensic significance corresponding to a main defect.

Under these circumstances it is evident that roaring for a long time has been of special interest to the veterinarian. So long as there has been a scientific knowledge of animal therapy the causes of the disease have been constantly investigated and a successful method of treatment sought. Into the investigations on the ætiology, the forensic significance, the medical treatment, &c., of roaring I will not enter here, but turn directly to the operative treatment of the affection.

The merit of first experimenting in and carrying out the operative treatment of roaring belongs to K. Günther, who has recorded the same in his topographic myology of the horse which has often been overlooked, but which is prominently mentioned here. K. Günther, after his father (F. Günther‡) had considerably advanced the knowledge of the causes of the complaint by his treatise (1834), has proved that in about 96 per cent. of all cases

* Abstract from a translation by Mr. Gladstone Mayall, M.R.C.V.S., from the *Archiv. f. Wissersch. u. Prakt. Tierheilkunde.*

† This opinion of Professor Eberlein's, expressed so clearly, is of exceptional importance and interest. My own observation too (from questions put to the respective owners, or persons in charge, of more than 650 roarers) bears out the statement that in a very large proportion of cases the "roaring" has not proceeded from hereditary causes. Strangles has played a *much* greater part.—Frederick Hobday.

‡ F. Günther. Investigations on whistlin or so-called hard blowing of the horse. Results of 100 observations and experiments.

there is paralysis of the laryngeal muscles supplied by the n. recurrens, and since the year 1845 experiments to cure this paralysis by operating have been in vogue. His curative method from the first has been directed to removal of the narrowing space defect (the narrowed lumen) of the glottis. He says about this: "I have for such object adopted six methods in the following sequence:—

"(1) Removed both vocal cords: the horses roared still.

"(2) Removed the ligaments of the glottis of the affected side: produced strengthening of the roaring. The arytenoid through cicatricial contraction was drawn down still deeper into the glottis and made it still narrower.

"(3) Removal of the vocal cord of the affected side together with the inner wall of the vocal pouch, so that the thyroid half of the vocal pouch remained intact: all the horses roared, some of them with a tremulous noise: here the arytenoid after cicatricial formation was very movable in the glottis.

"(4) The arytenoid exarticulated on one side in front of the ring and removed, together with the vocal pouch and cord, and completely extirpated, but the mucous membrane of the lower wall of the larynx left intact: the experimental horses so operated on died, as might only be expected, soon after the operation from inflammation of the lungs, because the larynx could not be closed when swallowing and food and drink passed into the lungs. I have, therefore, never adopted this method for the relief of roaring.

"(5) Cut off the anterior half of the arytenoid cartilage of the paralysed side at its joint in a triangular shape and removed it together with the vocal cord and vocal pouch: single results brilliant, others insufficient through shortening of the cicatrix; many no result, on extreme exertion intense roaring, but no danger of suffocation.

"(6) The vocal pouch between the thyroid and arytenoid cartilage removed, but the vocal cord preserved (the hinder edge of the arytenoid was regularly separated from the laryngeal wall close under the articulatory surface of the cartilage, so that it only remained in union with the thyroid superiorly by the mucous membrane of the larynx and inferiorly by the attenuated vocal cord). In single cases the external surface of the arytenoid healed very well and firmly to the thyroid, and the horses were cured and remained so; in other cases union took place too low down and the animals remained roarers; in yet other cases the arytenoid did not

heal firmly enough and the horses roared tremulously. The point of success lay in regulating cicatricial formation. Two methods to obtain this object may be employed: either the arytenoid at the termination of cicatricial formation may be fixed at a corresponding level, or a purulent process may be set up between the arytenoid and thyroid cartilage and the surfaces in apposition may possibly be made to adhere. The union of the edges of the arytenoid must be avoided as much as possible in order that the cartilage does not sink deeper into the larynx and heal in that position."

Stockfleth has conducted the operation for roaring since the year 1857, after his experiments in Hanover with K. Günther. He started from the hypothesis that removal of the lip of the arytenoid, whilst avoiding injury of the vocal cord, must be the object of the operation. On the cast horse placed on its back after separation of the skin and muscular tissue he split the crico-thyroid ligament, the cricoid cartilage and the first three rings of the larynx. Then he resected the anterior free half of the arytenoid whilst he made an incision "vertically from the place where the lips of both pyramidal cartilages unite to form an angle to the point from whence the vocal cord arises." Of eight roarers thus operated on, four horses became quite serviceable, two roared somewhat on severe exertion, and two were quite useless.

Stockfleth's experience has not produced any subsequent fruit.

Möller, in the middle of the eighteenth century (1886 to 1888), owing to the prevalence of the complaint was induced to make a few experiments in the matter. After he had obtained no successful results by resection of the vocal cords according to K. Günther, he experimented by three methods to cure roaring by fixation of the arytenoid cartilage. In No. 1 he opened the crico-arytenoid joint. In No. 2 he performed myotomy on the paralysed hinder crico-arytenoid muscle. In No. 3 he fixed the arytenoid to the cricoid cartilage.

None of these methods produced the amount of success required. Möller now resolved on resection of the whole arytenoid cartilage (arytenoidectomy) with careful preservation and retention of the mucous membrane.

Arytenoidectomy has had very varied results in practice. Some results have been favourable, but by far the greater number unfavourable.

Möller has seen twenty-two cures in thirty horses operated on. In spite of this he recommends the operation to be limited to such horses as have their working capability hindered by the influence of roaring.

Cadiot was content with his results, but only performed it on valuable horses, and gives no distinct statistics. Hirzel, in fourteen cases, saw five cures, four improvements, four not bettered, and one death from foreign body pneumonia. Vennerholm could only cure three out of fourteen horses. Frick concludes that the operations by himself and others had very varied results. Fröhner gave up the operation because of the bad results. I have told owners that the success of the operation cannot be assured by arytenoidectomy, but have only performed it four times. I had success in one horse, improvement in a second, and in a third the condition got worse, so that later tracheotomy had to be performed, and the fourth animal died of foreign body pneumonia, because after the operation the india-rubber ball of the tampon cannula got displaced. On the whole the operation has not resulted in what was originally expected of it, and, as Hirzel and Vennerholm hinted, arytenoidectomy has gradually died out.

In more recent times W. L. Williams, of New York, has again taken up the operation for roaring, and his experiences were first published in the Reports of the American Veterinary Medical Association in 1906. He refers to the experiments of F. and K. Günther, and says that both "within a few years had undertaken a series of experiments which actually comprise all methods of operation carried out up to now. All later experiments consist, for the most part, in a change of technical detail which was proposed by Günther half a century previously." The procedure employed by Williams, which on account of subsequent experiences has not been essentially changed, is only a modification and a completion of Günther's experiments. According to his last communications Williams performs excision of the vocal pouch which had also been proposed by K. Günther (No. 6).

Originally Williams conducted the operation in the following way: He performed tracheotomy on the day before the operation, and used a simple tracheo-tube. He rejected the Trendelenburg-Möller tampon cannula. For the operation itself the animal was put on its side and chloroformed, and at the same time the field of operation shaved and disinfected. Then the subject was put on its back,

the larynx opened in the usual way, by cutting through the crico-thyroid ligament and the cricoid cartilage, and the wound held open by a dilator. The vocal cord on the affected side was then seized in the middle with the long forceps, vocal cord with the mucous membrane on each side of the forceps, and behind dissected out with a long-handled scalpel, and this partly isolated section pulled up and drawn away around the mucous membrane which covers the ventricle. The lateral incisions were then carried forwards to the upper edge of the ventricle, where they met, and the mucous membrane of the ventricle being now completely cut around, dissected out. Above, the mucous membrane, as well as the remaining *musculus thyro-arytenoideus*, is carefully preserved. At the conclusion of the operation no sutures were put in, either in the ventricle or the external wound. After the hæmorrhage has stopped and the horse got up the wound is antiseptically cleansed. This cleansing is repeated for five to seven days with the internal wound and with the external wound until healed. The tracheo-tube remains in its position six or seven days, but is cleansed daily.

In the same way Williams describes the operation in the second edition of his "Surgical and Obstetrical Operations," whilst in a further communication he plainly modifies his procedure, and limits the operation to removal of the mucous membrane of the ventricle only (without the vocal cord): "This is an old operation which has already been publicly performed by Günther, but I could find nothing about the technique of the operation." In fact, this operation coincides exactly with that mentioned by Günther under No. 6 (see preceding), viz., removal of the vocal pouch between thyroid and arytenoid whilst sparing the vocal cord.

The horse is put on its back for the operation, chloroformed, and a tracheo-tube inserted. The larynx is opened by a central incision going through the crico-thyroid ligament, the cricoid cartilage, and the first tracheal ring. Then the mucous membrane of the ventricle is generally grasped with the forceps on the medial edge, near to the arytenoid cartilage, and with a long-handled scalpel an uninterrupted incision is made through the mucous membrane, right round the edge of the pouch. The mucous membrane of the ventricle thus isolated is drawn up with the forceps and carefully removed from the surrounding tissue. Williams furnishes a report of ten roarers operated on by the first and twelve by the second method. Of these twenty-two cases two died as a result of subse-

quent tracheotomy, but not from the operation itself. Seventy-seven per cent. were completely cured, or at least capable of usual work, and 14 per cent. remained unbenefited.

In England excision of the vocal pouch has been carried out by Hobday, of London, on a great number of horses. In the January number of THE VETERINARY JOURNAL for 1910, Hobday describes this operation as it was demonstrated to him by Williams, in London, and in the January number, 1911, of the same journal this operator reports on 112 successfully treated horses. He has experienced cure in 66 per cent. of all cases, and in the remainder a noticeable improvement. According to the most recent report, of April of this year (1912), Hobday has up to the present operated on more than 520 horses. He declares the operation to be of very great value, especially for hunters and carriage horses. Continuing observations were made on 100 horses which had been operated on from eighteen months to 2½ years, and cure was permanent. As instruments Hobday uses a retractor, an operating and swabbing forceps, both with a ratchet arrangement, and a scalpel with a long handle, and sharp knife.

A detailed description of the operation, as he has seen it in England, is given by Goldbeck, which practically coincides with that cited by Williams and Hobday. It is noteworthy, however, that Goldbeck, after opening the larynx, inserts a tampon impregnated with adrenalin solution into the vocal pouch, and after its removal stretches the pouch with an instrument resembling a glove stretcher,* and then cuts round the mucous membrane at the edge of the ventricle, just as Hobday does. With the help of a long knife, and, in case of necessity, of scissors, the mucous membrane is removed completely from its sac, whilst carefully sparing the connective tissue as much as possible. He reports nothing of his experiences.

Whilst I was employed in the preparation of this article a communication appeared by Pfeiffer on the technique practised by him in extirpation of the vocal pouch in roarers.

Pfeiffer casts the horse after the Danish method, having previously administered 30 to 40 grm. of chloral hydrate in 300 to 400 grm. of water intravenously, then for the production of deep narcosis he gives 100 to 200 grm. of chloroform by inhalation. The larynx is illuminated by an electric hand-lamp. To open the larynx

* This procedure was first practised by Woodruff.—G. H. W.

only the crico-thyroidean ligament is incised. The wound is stretched by the retractor according to Hobday and a tampon impregnated with cocain-adrenalin solution inserted with a forceps and then the drawn-up free edge of the vocal pouch swabbed with it. Then a specially constructed pouch stretcher is inserted and the folded surfaces of the wings are turned to the lumen of the larynx. After complete opening and slight traction in the stretcher the anterior edge of the entrance of the pouch is incised without difficulty. The incision commences at the anterior edge of the vocal cord and extends forwards to the cruciform cartilage. With the closed scissors following the inverted wings the mucous membrane within the incision is separated from the cord of the pouch and the stretcher removed. Whilst the incision is gradually extended and the mucous membrane at the same time cautiously loosened from the sub-mucosa with the closed scissors the mucous membrane pouch is gradually cut round, liberated and withdrawn.

No records of cases or results are given.

Although I had the opportunity of meeting Professor Williams in Berlin in the autumn of 1909, and witnessed a demonstration of his procedure on a preparation, I did not perform the operation myself until the summer session 1911. I first operated on several anatomy horses according to the instructions given by Williams, but then found that cutting out and removal of the thin-walled vocal pouch is not always easy if one dispenses with deep narcosis and tracheotomy. It may easily happen that one may cut into the mucous membrane of the pouch wall or its base, or make a rent in it. It is, however, important in order to effect a complete cure that the vocal pouch should be entirely removed, since otherwise a firm union of the arytenoid with the underlying tissue does not occur. To achieve this object I have adopted another method of taking out the vocal pouch.

Preparatory Examination of the Horse.

By inquiry the cause of the roaring and the length of its existence are, if possible, established. Of course, as a rule, one receives insufficient information on this point. Frequently the owner has only acquired the horse a short time previously ; often the complaint declares itself after an infectious illness (influenza, strangles, &c.). In these cases, however, the owners cannot say for

certain whether and to what extent the horse has been a whistler before the disease, but not unfrequently they have heard "somewhat loud breathing" or harsh respirations during excitement. According to my observations horses which develop roaring a short time after influenza and strangles in a marked degree are not unseldom slight whistlers beforehand. This experience is not without importance in connection with the operation.

The preparatory examination which I always carry out at least a day before the operation has the primary object of determining the degree of the complaint, for hereupon it is self-evident the prognosis of the operation depends. The greater the degree of the roaring the more considerable the changes that may be expected in the crico-arytenoid dorsalis muscle and the nervus recurrens respectively, and so much the more difficult the cure.

For treatment by excision of the lateral vocal pouches naturally only those cases are suitable in which the roaring depends on paralysis of the recurrens and the crico-thyroid muscle. On this account it is desirable that this should be established by previous examination. At once it may be stated, however, that it is very difficult by clinical proof to exclude with certainty hypothetical cases due to other causes, and, on the other hand, one can reckon with hard facts established by scientific examination, that 96 per cent. (Günther) to 99 per cent. (Fröhner) of all cases depend on a chronic paralysis of the recurrent and the dilator of the glottis. Finally, immediately after opening the larynx at the commencement of the operation, one can easily be convinced about the causes submitted. For this reason I consider previous examination with the laryngoscope as quite unnecessary, and in restless patients, when standing, the procedure is not without danger to the unskilled practitioner. On this account I do not always use the laryngoscope. Above all things, with the help of the laryngoscope, one can see the changes submitted in the arytenoid cartilage vocal cord and vocal pouch, and so surmise on the degree of the affection. However, one can also survey the conditions equally well at the commencement of the operation. To the ordinary practitioner the laryngoscope, as a rule, is not available.

Preparatory examination will include observation during lunging, riding, driving, &c., as well in movement as at rest, and is conducted in the usual way, as for a forensic test. It is recommended not to make the test immediately before the operation. Through the

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difficult breathing and hyperæmia of the laryngeal mucous membrane thus caused the conditions of the operation will be rendered more severe.

Preparation of the Horse.

The animal first gets used to the stable, feeding, and changed surroundings, settles itself down, and its general state of health may be examined ; I operate, as a rule, on the second or third day after arrival. In this period also the preparatory examination on the roaring is made.

Further, food and water are kept from the horse on the evening of the previous day and on the morning of the day of operation. A further withdrawal of food is not practised, but in the cold time of the year water is withheld for twenty-four hours.

Narcosis and Local Anæsthesia.

For the production of narcosis the animal receives, ten minutes before casting, according to its size, 40-60 grm. of chloral hydrate, with the drinking water (half to three-quarters of a bucketful of bran tea). As I have already stated in another place, chloral hydrate is exceptionally well taken in this way. If the horse is not prepared one only uses chloral hydrate solution, made into a soft bolus with meal and sugar, and given on the tongue. This method is easily carried out, and the somewhat risky intravenous injection or the unsavoury rectal infusion is dispensed with. Of course, one may need a second dose of chloral as soon as one has dissolved the first in the drinking water. Chloral hydrate is, however, cheap enough.

Deep chloroform narcosis, as practised by Williams, Hobday, Goldbeck, Drouin, and is recommended by Pfeiffer, I do not deem necessary ; in each case I operated without it, and experienced neither difficulties nor drawbacks. Especially have I never experienced the violent breathing with violent movement of the arytenoids, which mades a proper incision difficult. The movements of the left arytenoid are indeed, without that, considerably reduced, as a result of paralysis. As Möller has pertinently observed, the cutting through the laryngeal mucous membrane only causes slight pain, and he himself performs the very much more severe arytenoidectomy on the semi-narcotized animal. Apart from this, however, the production of deep narcosis occasions a considerable waste of time, and in

practice is beset with difficulties ; there is the slight disadvantage that blood is blown from the operation wound in fine drops when chloroform is not used, and the operator may take in a strong dose of chloral, but these can be quite diminished by the employment of local anæsthesia by careful staunching and swabbing of the blood, and by tamponing and holding back one's own head. However, the blood trickling into the larynx or trachea, and missed in swabbing, does not of necessity gain entrance to the lungs.

On the contrary, I always practise *local anæsthesia* and tampon the region of the operation and the laryngeal pouch with novocain-adrenalin solution. I bring the solution by means of a forceps or swab holder into the pouch, and leave the swab there for a few minutes. Then at the same time the neighbourhood is dressed with the solution. The addition of adrenalin acts as a vaso-constrictor and hæmostatic.

Instruments.

Besides the usual instruments, such as a razor, scissors, ball-pointed scalpel, button-pointed scalpel, pusher forceps, wound hooks, artery forceps, swab holder, I use a forceps without hooks, a spring wound stretcher, a pointed, slightly balled, a broad and a button laryngeal knife. This knife has a long handle and shorter, only 1½ cm. long, cutting blade. Besides a Priestley lamp or an electric pouch lamp is serviceable.

Operation.

When the effect of the chloral hydrate begins the animal is cast on the left side according to the Danish method. Then it must be noticed that the head rests somewhat lower than the withers so that blood present in the larynx does not gain entrance to the lungs. Now the neck and laryngeal region are stretched tight by extending the head. It is important that the head is not turned to one side, but that the neck is stretched straight. The laryngeal region is rubbed clean and dry, dry shaved, rubbed with sublimate spirit (1 in 1,000) and painted with dilute tincture of iodine (tr. iodi. and spirit ãã) twice. In the middle line, where later the incision is made, I inject subcutaneously novocain-adrenalin solution to produce local anæsthesia. Now I commence the operation. Neither a tracheo-tube nor a tampon tube is necessary.

The operator takes up a position on the left side of the neck. The operation may also be performed from the right side. I prefer

the left side, however. By careful palpation I now go over the field of operation and make out the thyroid bodies (prominentia laryngea), the thyroid cartilage incision place (incisura thyroidea caudalis), and the cricoid cartilage. The making out of these regions is not usually difficult. In doubtful cases one may suitably take an imaginary line which unites both branches of the lower jaw; this crosses the median line of the neck immediately behind the thyroid bodies. In strong growth of the muscles of the neck one alternately bends and stretches the neck. I now make with the balled scalpel an incision 10 to 12 cm. long through the skin in the middle line of the neck extending from the cricoid to the thyroid bodies, and with a short preparatory incision look for the fine white streak which is the dividing line between the two sternohyoid muscles and the two sterno-thyroids which I separate with a blunt object in order as much as possible to avoid hæmorrhage. I generally, however, encounter several small vessels in the subcutaneous tissue and muscular tissue which I take up with the forceps and twist or crush. Now the skin and muscle wound are held apart with wound hooks, and I can now feel the ligamentum cricothyroideum which unites the cricoid and thyroid cartilage, and at the same time bridges over the thyroid excision. This is, as a rule, covered with a layer of loose fatty tissue, which generally contains a few small blood vessels. This loose tissue is now cautiously penetrated, so that the thyroid bodies, the thyroid ligament and the cricoid cartilage are exposed. *Now I carefully arrest all hæmorrhage before opening the larynx.* When I have twisted the little spouting vessels then compression for a few minutes usually suffices.

Then follows the opening of the larynx. Some operators (Williams and others) split the cricoid ligament, the cricoid cartilage, and one or several tracheal rings. If one only splits the ligament the opening is very small and the operation more difficult. Separation of the tracheal rings I consider to be superfluous, because the opening of the vocal pouches lays and is directed towards the mouth, and hence access to the same by splitting the trachea is not improved. In order to secure a sufficiently large opening I penetrate the cricoid ligament, the cricoid cartilage, and the crico-tracheal ligament, but no more tracheal rings. I have noticed no disadvantages from splitting the cricoid cartilage, either in this operation or in cricotomy, which I have frequently performed. From my experiences in cricotomy I believe, on the contrary, that the cure of roaring is aided in excision

of the vocal pouch by cutting through the cricoid cartilage. Since the mucous membrane of the walls of the wings of the larynx only lies loose it can be easily detached on going through the cricoid ligament. Further, also, if one penetrates just at the moment of a swallow or deep respiration during which the arytenoid cartilages are approximated, one does not injure them. On this account I first penetrate the cricoid cartilage with the balled scalpel and then lengthen the incision with the button knife forward to the thyroid bodies and backward to the first tracheal ring. Then I place the wound stretcher in the larynx, so that it stretches the mucous membrane at the incision line, but leaves the entrances into the vocal pouches free.

Then the interior of the larynx is opened, and by use of the electric lamp I can now easily see into it. It is now easy to ascertain whether the roaring is due to the paralysis of the nervus recurrens, and of the dilator of the glottis, or to other causes. One now sees very plainly in swallowing and respiration the immobility or weakened movement of the arytenoid cartilage, and can also light up all parts of the larynx and palpate them.

After I have ascertained the conditions I insert into one or both pouches to be removed a tampon soaked in novocain-adrenalin solution. For this I use a forceps, artery forceps, or tampon holder. I only leave the wool in for a few minutes, since the mucous membrane quickly absorbs the anæsthetic. At the same time I carefully swab out all blood from the larynx.

Now comes the difficult part of the operation, excision of the lateral laryngeal pouches. I have already related the way in which Williams, Hobday, Goldbeck, Pfeiffer, &c., go to work.

Since I had noticed in the procedure according to Williams the wall of the pouch might be easily injured whilst being removed, and on that account complete extirpation be very difficult, and further having convinced myself of the easy extraction of the pouch by the blunt method on preparations and in the living animal, I have adopted the following procedure: After I have removed the swab I introduce the index finger of the left hand into the left laryngeal pouch, and by slight bending and lifting of the first joint of the finger stretch the dorsally situated vertex of the same at the joining place of the vocal cord, to the processus vocalis of the arytenoid cartilage. I then make at this place with the pointed or broad laryngeal knife a triangular incision, whose sides are only 1½ cm.

long, and of which the one extends to the anterior edge of the vocal cord, the second to the ventral edge of the arytenoid cartilage. The incision only penetrates the mucous membrane. This is stretched here so that the incision gapes just a little. Now I lay the knife on one side, take out the index finger from the pouch, and insert it into the triangular incision and push it slowly and rotating, and boring slightly along the wall of the pouch and into its depths, whilst I follow the extent of the pouch in its direction to the crico-arytenoid cartilage joint. When I have reached the base of the pouch which I can feel quite well, then I bend and turn the first joint of the finger against the base of the pouch whilst leaving the rest of the finger in the wound, thus loosening the base by slight traction from its foundation and press it forwards against the entrance of the pouch. By this procedure the pouch will be turned inside out and rest on the finger like a thimble. Now I pass the button laryngeal knife into the wound, at the same time holding the pouch fast with the thumb if necessary, so that it does not slip off the fore-finger and separate the pouch completely, whilst I cut along the edge of the entrance to the pouch. In doing this I take care that I neither injure the vocal cord nor take away too much of the mucous membrane covering the thyroid cartilage, so that healing of the wound will not be hindered or cicatrix contractions induced. If the operation is rightly performed the pouch is complete and uninjured. During the whole operation I have the field of operation lit up with an electric lamp, and carefully swab out any blood collected in the larynx. For the rest the hæmorrhage from the wound of the mucous membrane is only minimal. But it is very important that the bleeding of the skin and muscle wound is completely stopped before opening the larynx.

In removal of the right laryngeal pouch I proceed just the same, and still operate from the left side of the neck not changing my place.

With removal of the pouch the real operation ends. A suture is neither put in the mucous membrane of the larynx nor in the muscular tissue or external skin. Equally a bandage is objectionable; I consider both to be superfluous. Through the opening of the wound the secretion can easily run away. From this point the course of healing can be suitably controlled. But above all things the wound acts as a tracheotomy opening. In healing it is necessary that the arytenoid cartilage heals high and firm on its under surface,

which can best occur if it is kept as restful as possible. This is in every case favoured if the patient breathes through the wound for a long time.

For protection against post-operative infections I paint the laryngeal pouch wound with dilute tincture of iodine (tr. iod. and spirit āā), the external wound I powder with lenicet or other disinfectant. After this the horse is put on its side. It can, as a rule, be immediately unshackled and allowed to rise.

By the technique described the operation is not only considerably facilitated, but also considerably hastened. From the moment of opening the larynx and anæsthesation of the mucous membrane to conclusion of the whole operation I only occupy a few minutes. But it is important that the triangular wound is only made wide enough to admit the finger. Otherwise, the opening to the vocal pouch is stretched too much, and then the loosening of the mucous membrane in its depths is difficult.

After Treatment.—After the operation I put the horse in a stall; I prefer this in view of the previous narcosis to putting it in a box. The animal is fastened by a halter from which the throat lash is removed. During the first twenty-four hours the horse neither receives food nor water, in the second twenty-four hours only some water, and on the third day thin bran mashes and a little hay, and from the fourth day, if no complications occur, it is gradually put on to its regular food. However, small rations are given even now, and food as well as drink placed low down, so that the animal in taking it must stretch its neck downwards, and cannot so easily aspirate particles of food. The horse can now also be put in a loose box.

The after treatment of the operation wound is, as a rule, very simple. The wound on the mucous membrane of the larynx generally needs no treatment at all. From my observations it heals best if it is undisturbed. The external wound is treated on general surgical principles. I have it cleansed with a damp or dry swab several times daily, and dust some antiseptic powder (lenicet, itrol, &c.) on. For complete healing a rest of at least six to eight weeks is advisable. From the third week the animal may be led out in hand.

Course of Healing.—On the second day after the operation a mucoid or muco-purulent secretion may be seen at the wound. The mucous membrane of the larynx is rich in mucus secreting glands,

which on account of the unavoidable inflammation secrete profusely, thus infection with pyogenic cocci may easily occur from the straw. After eight to ten days the secretion diminishes noticeably and soon disappears completely. On an average the wound is closed in three to three and a half weeks. Healing of the external wound is very complete. As a rule the cicatrix can be scarcely seen later on, and in every case is not perceptible. The internal wound heals by second intention. The granulations not only fill in the defect, but grow also over the upper surface of the mucous membrane. In two experimental horses that were killed ten and twelve days respectively after the operation I found the cavity completely granulated up, and on the previous pouch entrance was a small granulation tumour 2·3 cm. long and 1 cm. broad, which was, however, hard and firmly set up. With the transformation of the wound and definite healing of the protruding granulation it disappears. In one horse in which four months after the first operation I took out the right vocal pouch I found a scar 2 cm. long. It was flat, firm and of whitish colour. The vocal cord was not quite smooth, but without contractions. By this process the arytenoid cartilage is firmly fixed (as if soldered) on its under surface ; but this is not direct to the thyroid cartilage, but to the m. ventricularis and m. vocalis which lie on the inner surface of the thyroid cartilage and adjust the union of the arytenoid with the thyroid.

Complications in the course of healing have only been noticed three times in thirty horses. In one case as a result of post-operative infection pyæmia of the mucous membrane arose so that treatment of the laryngeal wound had to be pursued. After eight days the trouble disappeared. In two horses with very narrow high larynges a quickly increasing distress in breathing suddenly declared itself on the second day as a result of spasmodic closure of the glottis. In both these cases a tracheo-tube was inserted which, however, was removed in three or four days respectively.

Prognosis of the Operation.—This cannot be prophesied with certainty. As K. Günther has stated, it depends very much on how the form of the healing takes place. If the arytenoid cartilage heals high and fast on its under surface then the horse is cured ; if it heals too low down then the animal remains a whistler or the disease gets worse ; if the arytenoid does not heal firmly enough then the horse roars with a tremulous tone. The manner in which the arytenoid

heals on its under surface cannot any longer be influenced after the operation. A fixation of the arytenoids in the high position is not possible. Of significance in this connection is the age of the complaint, and the consistence of the m. crico arytenoideus dorsalis. If atrophy of this muscle is not too far advanced high and firm healing is easily possible.

Further, it is important that the vocal pouch be completely removed in the operation. If small parts of the mucous membrane remain in the depths of the pouch then the membrane easily regenerates and the operation is not successful. Finally, it is of great importance that after the operation the course of healing is not disturbed by unnecessary movements of the arytenoid. I consider it advisable that the operation wound be not sutured, but kept open as long as possible, so that the animal can breathe through it and the larynx only be used little. The animal on this account should not be worked until at least six to eight weeks after the operation.

The above instructions carried out a favourable healing is not certain. But if the conditions in the greater number of horses are not unfavourable the percentage of cures is high. In the narrow high shaped larynges prognosis, however, is generally unfavourable. K. Günther reported cure in single cases, whilst in other cases the animals remained roarers, in yet others they roared tremulously. Williams, in twenty-two cases, lost two horses following tracheotomy, 77 per cent. were cured, or at least capable of full work, 14 per cent. on the contrary remained unbenefited. Hobday reports 66 per cent. of cures in all cases, and in the remainder a noticeable improvement. I myself, up to now, have operated on thirty roarers. Of the last nine no reports are to hand, and they may be excluded from consideration. One horse died as a result of colic and inflammation of the lungs (but not as a result of the operation). Of the remaining twenty horses, 15 = 75 per cent. were cured, 3 = 15 per cent. were considerably improved, and 2 = 10 per cent. were not cured and unimproved. Later on I shall give the results in further cases.

Of the thirty roarers I have only removed one vocal pouch (the left) in sixteen horses, and in fourteen taken out both pouches. From my experiences hitherto I agree with Hobday that it is better to remove both laryngeal pouches at the same time.

All in all the preceding narration shows that very favourable cure results may be produced by excision of the lateral laryngeal pouches.

THE BACTERIUM OF CONTAGIOUS ABORTION OF CATTLE DEMONSTRATED TO OCCUR IN MILK.*

By A. D. MELVIN.

Chief of Bureau, United States Department of Agriculture.

INVESTIGATIONS in the Bureau of Animal Industry have demonstrated the identity of a bacterium discovered in the milk of cows and the organism now widely recognized as the etiological factor in contagious abortion of cattle.

On August 24, 1911, in a paper presented at the annual meeting of the American Veterinary Medical Association by Drs. E. C. Schroeder and W. E. Cotton, of the Experiment Station of the Bureau, under the title "An Undescribed Pathogenic Bacterium in Milk," attention was called to a peculiar pathological condition frequently found in guinea-pigs that were injected with milk and afterwards permitted to live six weeks or longer.†

The micro-organism to which the pathological condition in the guinea-pigs was due was isolated, and it was definitely proven that it, and it alone, was the cause of the lesions, which, in their gross anatomical appearance, resembled the lesions of tuberculosis in guinea-pigs so much that distinction between the two pathological conditions was not certainly possible without microscopic examination. The micro-organism was studied as carefully as the facilities for bacteriological work at the Experimental Station permitted.

As a matter of course the discovery of the peculiar micro-organism, a small bacterium, aroused considerable interest in the Bureau, and it was not long before Dr. John R. Mohler, Chief of the Pathological Division, called attention to the close resemblance of the organism found in milk to the bacterium of contagious abortion, in which latter he was interested because he was making investigations concerning contagious abortion of cattle.

Experiments were at once undertaken, by Mohler on one hand and by Schroeder and Cotton on the other, to settle definitely the question of the identity of the two bacteria. The experiments have just reached the stage where it is absolutely certain that the bacillus isolated from milk—the organism that causes a slowly progressive disease in guinea-pigs with lesions macroscopically

* Bureau of Animal Industry, Circular 198.

† See *Proceedings of the American Veterinary Medical Association*, 1911, pp. 442-449. Also *American Veterinary Review*, November 11, 1911, pp. 195-206.

like those of tuberculosis—is identical with the bacillus of contagious abortion in cattle.

Those who are familiar with the descriptions that have been given of the organism of contagious abortion of cattle will easily recall how contradictory they are in many respects. Whether or not this is due to differences in the technique used by different investigators cannot be said, but it is interesting to refer to the matter here, because the identity of the bacillus in milk and the organism of contagious abortion of cattle studied by Mohler would have been decided much earlier if one difficulty, now settled, had not stood in the way, namely, that the tests made at the Experiment Station at first showed the bacillus from milk to be a Gram positive organism while the other bacillus was found by the Pathological Division to be Gram negative. The bacillus, whether obtained from milk or from other sources, is now looked upon as being Gram negative.

The final test to establish the identity of the bacilli was the similarity obtained, by Mohler and Traum in the Pathological Division and by Schroeder and Cotton at the Experiment Station, working independently, in the lesions produced in guinea-pigs inoculated respectively with the milk bacillus and the bacillus of contagious abortion, as well as the identity of the two organisms shown through the agency of the complement-fixation test.

In what respect the discovery of the bacillus of contagious abortion of cattle in the milk of cows is important can readily be seen by reading the paper presented by Schroeder and Cotton to the American Veterinary Medical Association mentioned above. In that paper it is pointed out that it is questionable what may be the practical importance of this bacillus, now demonstrated to be the bacillus of contagious abortion, occurring with a high degree of frequency in market milk. The fact that this organism was found in 8 samples of market milk among 77 samples tested (over 11 per cent.), and in the milk distributed by 6 among 31 dairies (over 19 per cent.), leaves no doubt that we are dealing with a phenomenon that is ominously serious in its significance for public health.

We do know that the organism causes abortion in cattle and some other animals, and that it causes progressive lesions of a serious character in some experiment animals; and although we do not know what effect it may have on human beings, we cannot

afford to assume that they are not affected by it. In this sense the bacillus forms another link in the long chain of facts that point unmistakably to the proper pasteurization of all milk before it is used as food as a measure essentially necessary for the protection of public health.*

THE NASO-PALATINE APERTURES, JACOBSON'S ORGAN, AND STENSON'S CANAL.

(*Continued from p.* 469.)

By THOS. B. GOODALL, F.R.C.V.S., F.L.S.
Christchurch, Hants.
(*Formerly Examiner in Anatomy to the Royal College of Veterinary Surgeons.*)

Mole.

Mole (*Talpa europea*).—The anterior naso-palatine apertures are pear-shaped, and are situated between the large two-rooted canine teeth. They are rounded anteriorly and pointed posteriorly, a large groove in the bony palate proceeds from the anterior to the posterior naso-palatine aperture, which is oval, and about twice the size of the anterior one, and is situated opposite the space between the first and second true molars. There is also a small central incisive foramen.

The tongue is smooth, but with a magnifier it is seen to be studded with numberless small papillæ. When the tongue is partially dried the papillæ stand out as a beautiful white velvety pile; each papilla appears to be nodulated (bead-like). There are two large circumvallate papillæ on the base of the tongue, and it has on its dorsum surface a number of transverse depressions that would probably apply to the bars in the palate.

Palate.—The gustatory pad is three-lobed and occupies the space close behind the first four incisors; there is a groove between the gustatory pad and the first bar. There are eight bars. The first five are continuous across the palate from side to side, being pointed backwards at their centres. The first bar is situated between the anterior edges of the canine teeth. The last three bars, between the molars, are discontinuous at their centres, forming a channel.

* Since this note was written, an article in the *Centralblatt für Bakteriologie, Parasitenkunde und Infektionskrankheiten*, vol. lxi., No. 7, by Theobald Smith and Marshall Fabyan, has come to notice, in which attention is called to the probable occurrence of the bacillus of infectious abortion of cows in milk, to the disease it causes in guinea-pigs, and to the possibility that it may cause disease in persons.

There are numberless small papillæ all over the roof of the mouth, but they are specially noticeable in the spaces between the bars.

The septum nasi is continued forward into the mobile snout a quarter of an inch, or so, in front of the premaxillary bones, and here it is very dense and hard, almost bony in structure.

There is a marked constriction in the aspect of the skull at the point of junction of the large nasal bones with the frontals; the frontals narrow to this point; and then the nasals bulge out, forming a lobe on either side enclosing the large olfactory organs. In the fresh specimen it is always markedly hyperhæmic at this narrowed part.

HEDGEHOG.

Erinaceus europeus.—The anterior naso-palatine apertures are formed differently from those of any other animal I have examined.

There is a distinct ridge along the centre of the palate, marking the line of articulation of the palatine and maxillary bones of either side. At a point just opposite the maxillo-premaxillary sutures the palatine processes of the maxillary bones separate slightly at the central symphysis and become depressed towards the mouth, and terminate in a sharp, angular point which juts out into the posterior margin of the anterior naso-palatine apertures.

The palatal processes of the premaxillæ are small, and pass backwards rather above, that is, on the nasal side of the maxillary processes, and adapt themselves to the central space caused by their separation.

There is a very decided groove in the premaxillary bone from the anterior margin of each aperture, leading directly to the large, central interdental space.

This arrangement of the apertures, the posterior part being lower (towards the palate) than the anterior, gives them the appearance of directing the channel of Stenson's canal from the nasal chamber, and by the pair of grooves, directly to the large central interdental space, in which is lodged the gustatory pad, and on which the large central proclivous lower incisors fit so exactly that all food entering the mouth must first be pressed on to these gustatory pads.

The posterior naso-palatine apertures are long ovoid openings, $\frac{1}{4}$ inch in length, and situated between the two posterior molars on either side and the central ridge of the palate; they are entirely in the palatine bones.

A channel in the palate from the anterior margin of each

posterior aperture converge towards the central ridge to as far forward as where the palatine plates of the maxillary bones commence to bend down ; and here the channels appear to spread out in these descending plates to the posterior edges of the anterior naso-palatine apertures.

Palate.—I have only a dried specimen by me for reference, and I am writing these notes from it. The gustatory pad is situated behind the four central incisors, its posterior edge is bounded by a semi-circular ridge, starting from the anterior edges of the third incisors, and circling forwards, giving the pad a crescent shape. I think I can detect the openings of Stenson's canals, one on either side of the central line of the palate, and immediately behind the large central interdental space, the pad itself extending through the space.

There are altogether eight pairs of bars, all discontinuous by the ridge at the centre of the palate. The first pair, starting inside the canine teeth, point directly forwards to a point in a space behind the gustatory pad ; the second pair curve first forwards from the sides of palate, and then point backwards at the centre of palate ; the third pair bend slightly forwards, and then go almost straight across. These first three pairs are large ; from here backwards they gradually become smaller, and tend to bend more and more backwards at their centres.

The Green Monkey (*Cercopithecus callitrichus*) or the Vervet (*Cercopithecus lalandi*).

Palate.—There are seven pairs of bars which are discontinuous at the central raphe of the palate, each bar curves inward from the gums and then sharply back to centre of palate.

The gustatory pad is well marked, it has on either side of it a raised portion of palate behind the incisor teeth, from which it is separated by deep fissures.

I think there is an oral opening to Stenson's canal. (I had no proper probe or instrument with which to test this.)

Anthropoid Apes.

Simia satyrus (Ourang-outang).—Anterior naso-palatine apertures. The nasal openings are seen, one on either side of the floor of the nostril, at a point parallel to the extremities of the roots of the canines ; they pass downwards and forwards through the bones of the palate, and open on the oral surface by a single centrally placed

aperture at a point corresponding to the second premolar. Passing forwards from the aperture is a smooth fossa which widens out immediately behind the first incisors.

Troglodytes gorilla.—The septum nasi is thicker than in Simia making the nasal openings of the anterior naso-palatine apertures wider apart. There is a very distinct canal on the floor of each nasal chamber which leads to the aperture, the nasal openings are more anteriorly placed than in Simia ; they pass downwards and forwards through the bone and open on to the palate by separate foramina at a point parallel with the first premolars.

In some specimens the bony central partition between the foramina is not quite continuous to the end of the aperture ; this gives the appearance of a single opening.

A narrow, smooth channel leads from the aperture to behind the first incisors.

Anthropopithecus troglodytes, *Troglodytes niger* (Chimpanzee).—The nasal openings of the apertures seen at the anterior point of the floor of each nostril take an almost directly forward direction through the bone parallel to a little forward of the roots of the canines and open on to the palate by a small single foramen parallel to the centres of the canines. A narrow groove runs forward from the orifice to close behind the incisors.

The anterior part of the bony palate is spongy and thickly studded with foramina.

BABOON.

Papio porcarius, or *Cynocephalus porcarius* (Chacma baboon).—The floors of the nasal chambers are hollowed to form wide channels, partly roofed over by a ridge of bone from the facial portion of the premaxillary bones, which lead to the nasal openings of the anterior naso-palatine apertures, these are very large, varying from $\frac{1}{4}$ in. to $\frac{3}{8}$ in. in length ; and looking at them from the nasal aspect, they appear to be directed downwards and forwards through the bone to the palate by the roofed ridge above mentioned. In the skulls of two males in my possession the nasal openings are just abreast of the large canines ; in a female skull they are parallel with the first premolars.

The palatal opening is a large single one, divided in the centre by a thin ridge of bone formed by the palatal processes of the premaxillary bones ; in the males it is $\frac{3}{4}$ in. long by $\frac{1}{2}$ in. wide, and in the female $\frac{1}{2}$ in. long by $\frac{3}{8}$ in. wide.

Immediately in front of the apertures proper, and forming their anterior moiety, is a deep, distinct, smooth fossa—really the palatal aspect of the roofed ridge of bone seen at the anterior part of the nasal aspect of the apertures.

The palatal apertures extend in the males from the centre of the canines to close behind the central incisors, and in the female from about the middle of the second premolars to the canines. There are generally several rather large incisive foramina in the premaxillary bones.

In the early part of this paper I explained that the anterior naso-palatine apertures were always formed by the premaxillary and the maxillary bones. The fact that they are sometimes seen to be

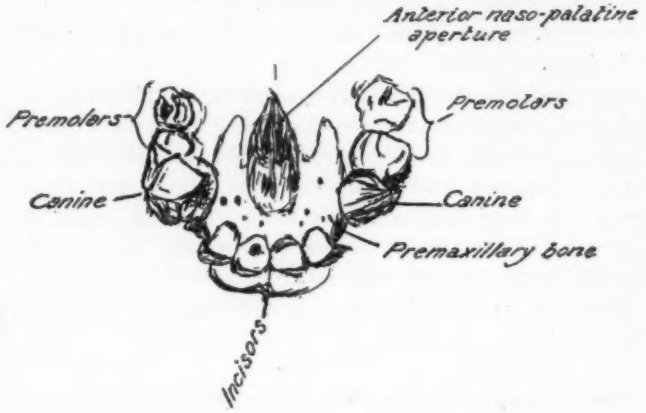


FIG. 10.—Bony palate of Chacma baboon (*Cynocephalus porcarius*).

parallel with the premolar teeth would seem to contradict this statement; but the position is due to the peculiar conformation of the premaxillary bones, from the body of which is sent back a wing which is dovetailed between two anterior prolongations of the palatal portion of the maxillary bones.

MAN.

Palate.—There is a raised portion immediately behind the incisor teeth, which extends backwards as far as the first true molar teeth.

The gustatory papilla is centrally situated immediately behind this, and at the point corresponding to the space between the two central incisors.

On either side of the papilla is an imperfect bar which terminates behind the papilla.

There is a wide central raphe separating the bars on either side of the palate.

There are three well-marked pairs of bars somewhat S-shaped, and in the spaces between the bars are one or two small papilla.

These notes were made from a plaster-cast of a mouth kindly made for me by Mr. Tait, Dentist, Rokstad, East Griqualand.

MARSUPIALS.

Petaurista volans.—There are two anterior naso-palatine apertures, one on either side; they are long and elliptical, the anterior points are in a line immediately behind the third incisors, and they extend backwards to the first premolars. There is a bulging bony ridge on the central aspect of each aperture, and it appears to be hollowed out on its outer margin. The central incisors are not in contact, and there is an appreciable space between the incisors and the openings of the apertures.

The posterior naso-palatine apertures, common to the marsupials, are very large, corresponding to the three last molars, the palatine bones thus forming merely a very narrow bridge of bone across the posterior edge of the palate.

Pseudochirus occidentalis.—The anterior and posterior apertures are of the same shape and in the same situation as in Petaurista, but there is a broader bridge of bone behind the large posterior apertures.

Phalanger vulpecula.—The outer bony edges of the anterior naso-palatine apertures are raised and partially cover the apertures; the posterior apertures are large. The bony palate is roughened.

BIRDS.

That some birds have a gustatory organ analogous to mammals is evident by their manner of selecting or rejecting food. I have carefully watched them feeding, and I am convinced that this must be so.

In the month of June I gave a lot of twenty three-months-old chickens a quantity of chopped lettuce leaves, with which I mixed a number of chopped leaves of nasturtium; the lettuce was devoured greedily, but every time one of the chickens "picked" a piece of nasturtium it was immediately dropped and rejected, though it had never been further in the mouth than the end of the beak. After

the lettuce was finished a few of the chickens turned their attention to the nasturtium, and ate, and apparently enjoyed, a few mouthfuls. The point is, the bitter taste of the nasturtium was detected amongst the better appreciated lettuce by the agency of the gustatory pad, and these were rejected until the lettuce was finished.

I have watched starlings busy on my lawn, diving in their beaks every inch or two of the surface searching for their food of worms, and I can come to no other conclusion but that they must be provided with an olfactory taste organ at the extremity of the beak. The necessity for such an organ is emphasized in such birds as the snipe (where the papillæ on the beak indicate its presence), the curlew, and other long-billed birds.

Domestic fowl.—The beak of the lower jaw is overlapped by the beak of the upper jaw, and, in feeding, the point of the lower beak presses the food picked up against the gustatory pad that is situated in the inner part of the upper beak at the anterior part of the palate.

Dissection.—Cut the cheek as a continuation of the mouth and turn down the lower jaw. Just between the anterior nares and the eye a thin membrane will be noticed, which is the lower wall of the large air-chamber of the head ; open this wall and there will be seen an elliptical opening to the nasal chamber, exactly at the antero-inferior border of the eyeball. This chamber can be traced all round the eyeball and into the eyelids, and it extends anteriorly between the floor of the nasal chamber and the palate, to a point coinciding with the posterior edge of the nasal opening ; here, by an opening towards the central line, large enough to admit a small probe, it extends over that part of the roof of the palate formed by the premaxillary bones, and is lost in a little erectile tissue. There appears to be a large nerve distributed here.

The large cavities would be the analogies of the sinuses of mammals, but the anterior branch is surely the analogue of Jacobson's organ.

The naso-palatine aperture is very large and single, occupying the greater part of the roof of the mouth in the bony skeleton.

The septum nasi terminates at its anterior extremity, in its upper margin by two lateral folds which form the cartilages of the anterior nares, and in its lower margin by two processes which pass through the naso-palatine aperture to the under surface of the palate, much in the same way as the canals of Jacobson's organ are formed in the horse.

In conclusion, I hope it will be admitted that I have said enough to prove that the shape, situation and size of these anterior naso-palatine apertures are of some importance in the classification of animals, and further that, through the agency of Stenson's canal and Jacobson's organ, they are intimately connected with the sense of taste, which is intensified or diminished in the individual according to the capacity and the disposition of these apertures and organs.

Possibly, too, I think it may be found that cartilage is not only a conductor of sound, but also of smell and taste.

Since writing the above I have had the opportunity of witnessing the cutting up of several whales at Durban. In these huge mammals

FIG. 11.—Palate of Hyrax capensus.

the ears have no external conchæ, and the external openings of the ears are very small and on a level with the skin; but on following the course of the external meatus to the tympanic bone, it is found to be surrounded by a dense mass of yellow fibro-cartilage, evidently the analogue of the external concha of land mammals, stowed away under the skin in the whales, in the process of time, because external ones would have been inconvenient for movement in the water.

As the sense of hearing is fairly acute in all the cetacea, and the opening of the external ear is so very small, it is probable that the mass of fibro-cartilage surrounding the external meatus still acts, in the form of a specialized concha, as a conductor of sound.

Clinical Articles.

AN ABSCESS OF THE STOMACH-WALL AND ŒSOPHAGUS OF A HORSE.

By WM. WILLIS, M.R.C.V.S.

London.

I saw the mare concerned on the evening of July 22—an aged light vanner. She was said to have been very dull in her work on previous day, and had refused all food and drink since. Temperature 102° F. She was said to have had blowing fits of four or five minutes' duration several times during the day.

I noticed that the neck muscles below the trachea were cramped, and corners of mouth drawn up and back. She took a handful of food from the keeper, chewed it for a while, and then dropped it. After doing this a second time I had a gag put in her mouth for examination of teeth. This set up movements as if she were about to vomit. There were no further violent spasms after removal of the gag. I had all food removed, and left her with a little water, and during the night she made several attempts to drink, but made no impression on the amount of water in the pail.

The condition was much the same on the next day—neither food nor water taken. I thought the case was impaction of the thoracic portion of œsophagus, and gave a dose of arecoline. The first injection gave rise to a profuse flow of saliva, and she passed a goodly amount of dung and wind.

As she made no attempt to drink or eat, a second injection of arecoline was given, and after a period of salivation and distress she went to her pail and drank quite freely.

I began to fancy I had done some good, and that my fancied obstruction had been passed on.

For the next two or three days she ate a little, and had a fairly violent blowing fit after each feed, and frequently slight signs of choking.

On July 26 I noticed some swelling at the base of the neck, around the entrance of the trachea into the chest. Her temperature was now 105° F., and kept near about at that till her death.

The swelling at the base of the neck ran steadily upwards, wiping out the jugular furrow, and rounding up the lower part of the neck.

The throat became much swollen and then the sides of the face. She died early on the eighth day after she was noticed amiss.

At the *post-mortem* the abdominal viscera, except the stomach, seemed healthy. On severing the œsophagus, behind the diaphragm, to allow of removal of the stomach, I noticed that the tube was surrounded by a distinct blackish circle, and this was continued through the chest. The thoracic portion of the œsophagus was surrounded by a dark, dirty, foul effusion, and when the cervical portion was reached the connective tissue along the course of the œsophagus and trachea seemed to be destroyed, and its place taken up by this effusion.

The stomach showed a rather large abscess in its wall, near the entrance of the œsophagus, and the lesion appeared to be continuous with that in the wall of the œsophagus. Unfortunately, the stomach got cut about badly in getting it out, but I could not make out any flaw in the mucous membrane likely to have given rise to the abscess.

I sent the specimen to Professor Wooldridge, who expressed the opinion that "the condition was due to a small punctured wound of the mucous membrane at the œsophageal entrance into the stomach, and that organisms had penetrated into the submucous coat, resulting in the slow formation of the abscess, which had extended into the œsophageal wall. The abscess cavity contained very offensive fluid, and a quantity of broken-down connective tissue, with a large variety of micro-organisms. A small probe, which was passed down one of the many tracks, led through the mucous membrane, indicating the probable origin of the trouble."

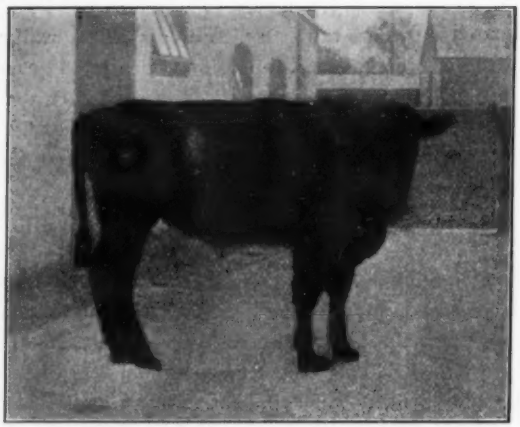
The case is unlike anything I have seen hitherto, and I trust it may prove of interest.

GUT TIE.

By W. W. GRASBY, M.R.C.V.S., and H. REYNOLDS, M.R.C.V.S.
Daventry.

On April 1, 1912, we were called to a black poll bullock supposed by the owner to be *griped*—as the animal had been noticed to be showing signs of colic the previous evening. We found the bullock lying down, in which position he appeared comparatively comfortable. When made to get up he continually shifted his hind legs and when

left alone was soon down again. The temperature was normal, and the pulse only slightly quickened. An hour or so previous to our visit he had been seen to pass a very small quantity of fæces covered with mucus. This condition added to our suspicion of a case of gut tie, and so a draught composed of ʒii of extract of belladonna in a pint of linseed oil was given in preference to a powerful purgative. We saw him again the same evening, the bullock then showing no further symptoms of increased pain—no fæces had been passed, but occasionally small quantities of mucus. Another dose of belladonna was given.



Photograph showing site of incision.

On April 2 bullock showed similar symptoms, but no medicine was given. On examination per rectum a distinct "cord" was felt hanging from the pelvis and constricting a portion of intestine. Being satisfied that "gut tie" was the cause of the trouble the owner was consulted with a view to operation, about which he hesitated and only gave consent on the morning of the 3rd, when at 7 a.m. the patient was walked about one mile to our infirmary. On arrival the area of operation (see photograph) was closely clipped and washed thoroughly, and, when dry, tincture of iodine was painted on.

The bullock was secured by the head, his left side close up against the wall and a strong pole placed against the right side to secure him as firmly as possible. Operation was then proceeded with in the manner described by us in THE VETERINARY JOURNAL for

May, 1907 (pp. 274 to 277).* A fair quantity of fæces was passed about two hours afterwards. The bullock was carefully fed on crushed oats, bran and hay chaff, and a liberal supply of linseed gruel to drink. He made an uninterrupted recovery and left the infirmary on April 8. The stitches were removed (whilst the patient was at grass) on the 13th, since which he did as well as his companions and was sold fat with the others.

NOTES ON A CASE OF TETANUS.

By D. F. W.

Subject.—Brown Arab filly, 2 years old, in rather poor condition.

History.—Had suffered from a slight abrasion of the skin behind the withers three weeks prior to date of first visit. On arrival, 6.45 p.m., May 17, 1910, I found the animal suffering from tetanus, trismus very marked, and the membrana nictitans rolling over the eyes. Was fairly quiet and took a little grass and lumps of sugar from owner's hand.

Treatment.—Removed filly to darkened loose box with sawdust bedding. Shaved forehead, injected cocaine and drilled a hole into cranial cavity with archimedean jeweller's drill and injected 50 c.c. anti-tetanic serum; closed wound with Whitehead's varnish. Gave 2 oz. artificial Carlsbad salts in drinking water.

May 18.—Filly standing very quietly. Limbs now very rigid. Feeding a little on grass and scalded bran. Drinks water freely. Injected 20 c.c. anti-tetanic serum in neighbourhood of original abrasion and gently massaged surrounding skin. Ordered well-cooked oatmeal gruel in half-gallon of milk to drink.

During the night a violent thunderstorm occurred and filly fell down and was unable to rise. On arrival on morning of May 19, I found the symptoms much aggravated, trismus more marked, with occasional spasms. Bowels inactive. Emptied rectum and bladder. Gave intra-cerebral injection of 50 c.c. anti-tetanic serum, making fresh wound in skull and sealing as before, antiseptically, of course. Sent cart home for slings. Ordered

* This article, which was illustrated, described the operation in detail and gave notes of some thirteen cases.—Eds. V. J.

enemata of milk and gruel and filly to be turned over every two hours.

Five p.m.—Slung filly *very quietly*, with some difficulty. Marked knuckling over of all fetlocks, but after gently hand-rubbing and persistently placing feet flat on the ground, she stood fairly well in slings. Bladder very full. Passed catheter. Urine smelling very strongly like odour of painter's size. Gave Carlsbad salts in drinking water and injection of Tallianine (terpene ozone) into left jugular. Blood from vein very dark and "tarry."

May 20.—Filly fairly comfortable in slings. Eats a little grass. Bowels acting slightly. Fæces soft. Passed catheter and gave injection of 1 pint of normal saline solution into right jugular. Blood from jugular quite altered in character, much more fluid and now almost as bright red as arterial blood. Gave 2 dr. calomel in gruel. Weather intensely hot. Hung wet sheets in doorway and window. The continued hot weather had a very bad effect on the patient, who sweated heavily and hung wearily in the slings. On May 22 I found her blowing hard and feared she must soon collapse from exhaustion. I injected 10 c.c. Tallianine into left jugular with excellent results. In one hour her respirations were normal, she dried off and commenced to feed. When feeding now she grinds her jaws well and the muscles of the limbs are relaxing. Apart from weariness, condition is much improved. Lowered her gently on to thick bed of sawdust and left her lying in slings with orders to pick her up in two hours.

May 23.—Marked improvement. Attendant reports filly slept profoundly for three hours. Was then picked up much refreshed but somewhat cramped. Feeds well; bowels active; micturates freely. Gave intravenous injections of Tallianine daily for several days, as attendant reports she is always so much brighter for several hours after its administration. From this time forward the filly continued to improve, although unable to stand without slings, until five or six weeks from outset of disease, owing to knuckling of joints and atrophy of scapular muscles. This was eventually overcome by bandaging and electrical massage.

The case was further complicated by complete eversion of the bladder on two occasions, on the second of which it was necessary, owing to her violent straining, to administer chloroform before reducing the eversion, but ultimately she made a complete recovery.

STREPTOTRICHOSIS IN A BULLOCK IN INDIA.

By Major G. K. WALKER, F.R.C.V.S., and R. BRANFORD, M.R.C.V.S.
Indian Civil Veterinary Department.

In Part III of Volume III of the *Journal of Tropical Veterinary Science*, Holmes described a peculiar form of streptotrichosis among the Army transport bullocks at Calcutta. A case of this disease in a bullock in the Punjab is now recorded.

History.—At the inspection of a district veterinary hospital a bullock was found from the neck of which a large tumour had just been removed by the assistant in charge. From the position of the wound, which had been sutured, it was evident that the prescapular gland had been affected.

It was reported that the tumour had been increasing in size for about three years, and that latterly there had been a considerable discharge of pus.

This discharge might have been caused by the application of irritating remedies by the owner. There was no history that the tumour had resulted from a wound or sore.

Symptoms.—The animal was lame before the operation. No records of pulse or temperature had been made. The patient was in fair condition, and the appetite unimpaired. The veterinary assistant stated that before the operation digital examination revealed the presence of some hard nodules.

No other tumours were detected.

Treatment.—The assistant had cast the animal and dissected out the tumour, with the usual precautions. The edges of the wound had been sutured.

For four days after the operation the animal was retained as an in-patient, and the wound syringed and dressed regularly. At the end of that period the owner insisted on taking it away. He was given some dressing, and instructed how to use it. The animal was inspected fourteen days later by the veterinary assistant, when the wound was found to be healing up, but there was considerable discharge. The case was seen again on the twenty-eighth day, and the wound was found to be healing satisfactorily, with little or no discharge. On the thirty-seventh day the wound was found to have practically healed, and the bullock had been used for ploughing for several days past. It was in fair condition and walking sound. No other tumours could be seen.

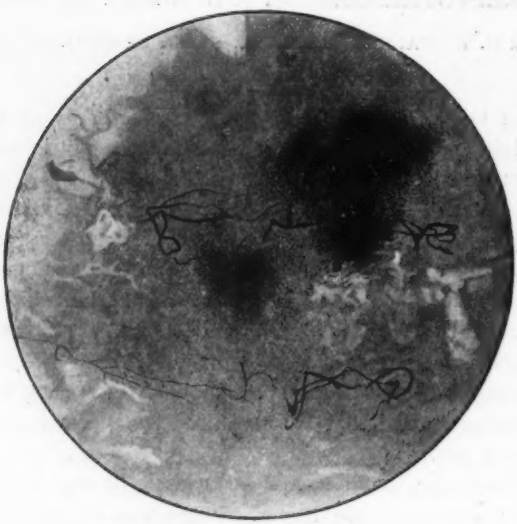


FIG. 1.—Scraping — × about 500.

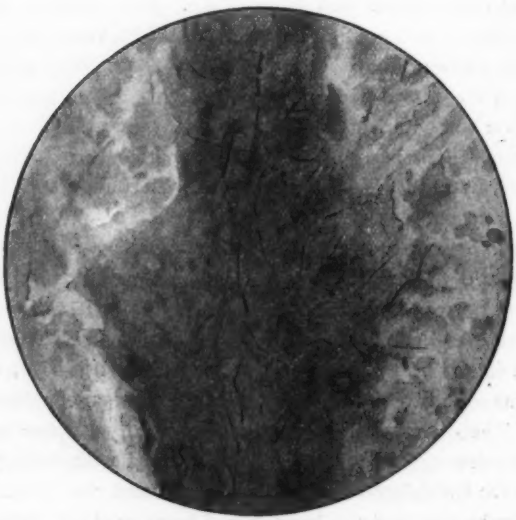


FIG. 2.—Section showing filaments — × about 500.

Pathology.—The tumour appeared to be an enlarged gland. It was oval in shape, and somewhat larger than a turkey's egg. On section it was found to be composed of fibrous tissue, with a fibrous capsule between one and two inches thick. Towards the centre, where it was hollow, the tissue had undergone degenerative change, the lining of the cavity being ragged and irregular.

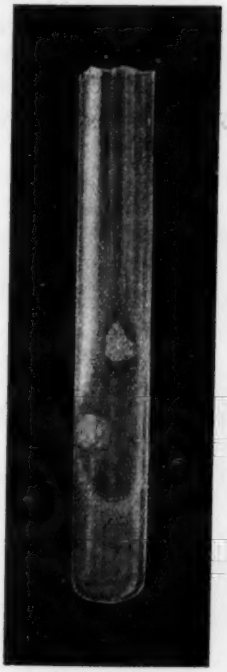


FIG. 3.—Culture on agar.

Bacteriology.—Scrapings made from the incised portions revealed the presence of a streptothrix.

The organism stained well by the method of Gram, but did not retain the stain by Ziehl-Neelson's method.

The organism was found in three forms, viz., branching filaments, cocci, and club-like.

The thickness of the filaments was very variable. Some approached the club-like forms, whilst others appeared to be made up of chains of cocci. In the colonies all three forms were usually

to be found, but some appeared to be made up of club-like forms only. In no instance did their forms assume the characteristic rays of the actinomyces, however.

In sections made from the wall of the tumour the colonies presented a similar appearance to those in the scrapings. The branching filaments could be traced in the form of a network in most of the sections. The tissue in the immediate neighbourhood of the colonies was cellular, but the mass of the tumour consisted of inflammatory fibrous tissue.

Cultural experiments were made on ordinary agar and in broth. In both media a fairly abundant growth was produced in about forty-eight hours.

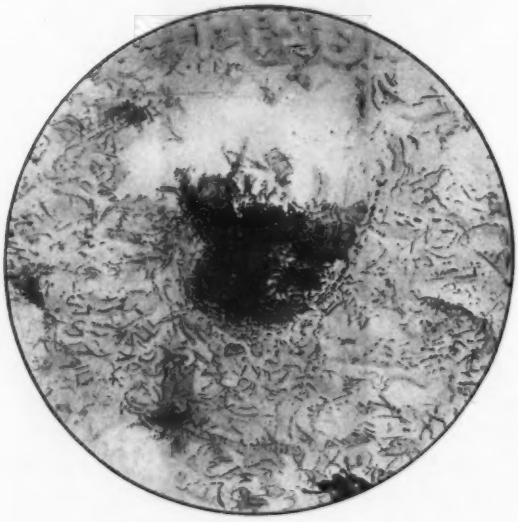


FIG. 4.—Culture — × about 500.

The growth on agar was at first pale in colour, but in a few days it turned yellow, and the surface became crinkly. The cultures did not tend to extend outwardly, but they got thicker and became heaped up on themselves. In broth most of the growth sank to the bottom of the tube in the form of small dirty white fluffy-looking balls.

A small portion remained on the surface, adhering to the sides

of the tubes. No growth was obtained on potato or under anærobic conditions.

Microscopical examination of the cultures revealed all three elements of the streptothrix.

In young cultures the filamental forms seemed to predominate.

In older cultures the cocci-like forms appear to lose their power of retaining the stain by Gram's method.

Inoculation Experiments.—An emulsion, made from an agar culture a week old, was inoculated subcutaneously in the left shoulder of a six months' old cow calf. In twenty-four hours a swelling appeared at the seat of inoculation, and the prescapular gland on that side had begun to enlarge.

The gland continued to enlarge for six days, and then gradually to return to its normal condition.

The swelling at the seat of inoculation continued to increase until, on the thirteenth day after injection, an abscess, the size of a hen's egg, had formed.

This abscess was opened, and several ounces of sticky yellow, gritty pus was evacuated.

On examination the pus was found to contain similar growths, morphologically and culturally, to those of the original tumour.

The abscess began to heal at once. Six days afterwards, and without further treatment, the abscess had almost completely closed up, but scrapings from the small cavity that remained still disclosed the presence of the streptothrix.

The elements, however, did not stain very readily, and appeared to be disintegrating.

Ten days from the abscess being opened no sign of it remained.

A guinea pig, inoculated from the same emulsion subcutaneously at the same time as the calf, appeared to suffer no inconvenience.

Description of Figures.

No. I.—Scraping from original tumour.—Stained by Gram's method, about 500 diameters.

No. II.—Section of original tumour, showing filaments.—Stained by Gram's method, about 500 diameters.

No. III.—Drawing of culture on agar.—One month old.

No. IV.—Smear from culture.—Stained by Gram's method, about 500 diameters.

N.B.—Drawings with camera lucida, by Mohammad Hanif, artist, Punjab Veterinary College.

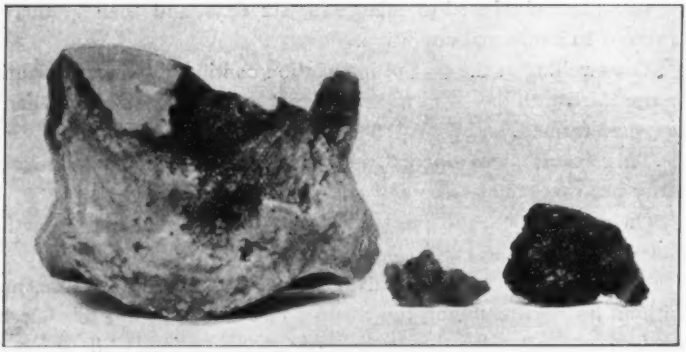
[The illustrations of this article have been slightly reduced, the originals being magnified about 650 diameters.—Eds. V. J.]

AN INTERESTING FRACTURE OF THE "OS CORONÆ."

By FREDERICK HOBDAY, F.R.C.V.S., and DAVID DUDGEON, M.R.C.V.S.
Kensington, W.

The photograph depicts an interesting fracture of the "os coronæ," and the case is worth placing on record on account of the method by which the injury was caused and the length of time which the animal worked afterwards before the displacement was sufficient to cause fracture to be suspected.

The patient, a well-bred shire-gelding, one of a large stud, was found about midnight by the night watchman to be cast in the stall, the off hind heel being caught in the rope of the head collar in such



Fractured Os Coronæ.

a way that the head was drawn back to the right side and the hind leg extended forward.

The animal had evidently been endeavouring to nibble its hind leg and must have struggled violently to free itself.

This was on the night of May 29, but beyond a slight bruising of the heel which necessitated three days' rest, nothing else manifested itself.

On June 6 the horse fell lower on the same leg and was treated for eight days, being then sent to work. After working for two days it was again lame and had to be rested in the stable.

On July 12 the lameness was very acute, and an abscess formed and burst on the outside of the fetlock, two others subsequently forming on the front of the coronet. These were treated, but did not heal up, and the poor beast was in agony. On the 19th a large

exploratory incision was made and the presence of a fracture communicating with the front of the pedal joint clearly demonstrated, a piece of loose bone about the size of a filbert nut being detached. The poor beast was humanely destroyed and a *post-mortem* examination revealed the fracture as shown in the photograph.

The fracture is peculiar in that the interior of the "os coronæ" (the only bone broken) appears to be as if "scooped out," and the abscess had apparently started in that, and had eventually progressed downwards until the pedal joint became involved.

Canine and Feline Clinicals.

CHRONIC ORCHITIS AND SUPPURATIVE PROSTATITIS IN A BULLDOG.

By A. NEISH, M.R.C.V.S., and J. W. HAYES, M.R.C.V.S.
West Hampstead, London.

The subject was a brindle bulldog about four years old. The owner had observed a large oval swelling in the right groin, and also that dogs were in the habit of following the animal as if it were a bitch. The owner noticed nothing abnormal till about six months before he brought it in. At that time the mammary glands and teats became much enlarged like those of a bitch with pups, and it was then that the dogs started following the animal. On examination it was found that there was no scrotum, but in its place two folds of skin exactly resembling a vulva, although there was no opening between the folds. The teats were much enlarged and there was no *bulbus penis*. The prepuce was somewhat swollen.

The swelling in the groin was diagnosed as a diseased testicle, and an operation was suggested, but for the time being the matter was dropped as the dog seemed in no way inconvenienced by his deformity and appeared to be in good condition.

Three weeks later, on July 27, the owner called to say that the swelling was larger and that the animal was hardly able to move and seemed to be in great pain. He wished the animal to be destroyed. This was accordingly done and a *post-mortem* made giving the following results :—

The swelling in the groin proved to be a large testicle lying in the subcutaneous tissue just over the inguinal canal. Its surface

was irregular and showed some dull white patches. Its weight was about 5 oz. On cutting through the abdominal wall the bladder was immediately revealed very much dilated and congested. The prostate was also much enlarged, most of the enlargement consisting of two purplish sacs containing a thick mucus-like fluid with a fœtid smell. The weight of the prostate was about 3½ oz. after the fluid in the sacs had drained off. The urine in the bladder was thick and smelt badly, but was not discoloured. The bladder and prostate occupied so much of the space in the abdominal cavity that the bowels were displaced forwards and the stomach was twisted over to the left side. The kidneys were enlarged and flabby and the left one had cavities in it containing what appeared to be a mixture of blood and urine. The organs in the thoracic cavity were normal. Although specially searched for there were no traces of another testicle or of an immature vagina or uterus. The testicle and prostate were sent to Professor Wooldridge for microscopical examination and his report follows. "Each half of the prostate contained an abscess cavity with a quantity of micrococci and putrefactive organisms. Microscopic examination of sections showed that the testicle was affected with chronic orchitis, the testicular substance being almost entirely obliterated by fibrous connective tissue."

BARLEY AWNS IN THE PREPUCE OF A CAT.

By G. DUNLOP-MARTIN, M.R.C.V.S.

Westcliff-on-Sea.

On August 6 I was consulted concerning a 12-year old male castrated cat with a painful and swollen perineum. An examination showed what seemed like a thick barley awn protruding from his prepuce, which was considerably swollen. With some difficulty this "awn" was firmly grasped and a vigorous quick pull brought away a bundle of three wild barley grains with awns complete! Incidentally the cat shrieked and bit the owner—but that's a detail! The grains had quite a macerated appearance.

The swelling and pain gradually subsided and the cat has made a good recovery.

This is the first time I have found these things in a cat's prepuce.

Report.

IMPRESSIONS OF THE INTERNATIONAL CONGRESS ON TUBERCULOSIS.*

By NATHAN RAW, M.D., M.R.C.P.

Physician of Mill Road Infirmary, Liverpool.

The Tenth International Tuberculosis Congress was held in Rome from April 14 to 20, and was attended by over three thousand persons. The Congress was under the distinguished patronage of the King and Queen of Italy, who attended in royal state at the solemn opening in the Hall of the Capitol on Sunday morning. The revered and aged President, Dr. Baccelli, presided, and made a most interesting speech on the work which was being done in Italy to combat tuberculosis, after which each country in Italy was represented by a delegate who briefly mentioned the work which was being done in his own country.

The serious work of the Congress was divided into three sections: (1) Social Measures against Tuberculosis; (2) the Medical and Surgical Pathology and Therapeutics of Tuberculosis; and (3) the Etiology and Epidemiology of Tuberculosis. In addition to the sections, eight general conferences of the Congress were arranged to hear addresses on eight different subjects, one being by Dr. Philip, of Edinburgh.

Human and Bovine Tuberculosis.

The most important subject which was down for discussion was the question of human and bovine tuberculosis. It will be remembered that at the last Congress, held in Washington, the memorable discussion took place on this subject, and on which Professor Koch maintained his position regarding infection from animals to man, when it was decided to continue the discussion at the Rome Congress. This discussion was eagerly anticipated, and was taken part in by several scientific workers. The position taken by Professor Koch was explained in a paper written by Professor Pannwitz, who drew up a statement on the voyage from America to Germany, and submitted it to the distinguished Professor for his approval. This opinion is briefly as follows: "Koch took the same position then as he did in London in 1910—that bovine tuberculosis can be transmitted to men, but that it very rarely causes serious disease. Koch contended that pulmonary tuberculosis in man—the principal manifestation of the disease with which preventative medicine has to deal—was not caused by the bovine, but by the human bacillus. He therefore desired that all activities should be concentrated on this. He objected to the campaign against bovine tuberculosis—necessary in itself for economic and agricultural reasons—being associated with measures against human tuberculosis. He never objected

* Abstract from the *British Journal of Tuberculosis.*

to the measures insuring the purity of milk and the products of milk, as milk is the medium through which many other infective diseases may be transmitted. He did object to these measures being placed in the foreground as having a bearing on the prevention of tuberculosis in man. Koch expressed his intention of undertaking further extensive investigations which aimed at proving the existence of bovine bacilli in human pulmonary tuberculosis with patients whose sputum could be examined over a considerable period of time. In his opinion the necessary investigations would be very laborious and expensive, and therefore could not be undertaken by small laboratories. In consequence, the only results that might be considered of value would be those of the Imperial German Board of Health and the British Royal Commission." The discussion was taken part in by the following workers, who read papers on the subject—*viz.*, Messrs. Calmette (Lille), Kossel (Heidelberg), Sims Woodhead (Cambridge), Nathan Raw (Liverpool), Moellers (Berlin), Neufeld (Berlin), Malm (Christiania), and Rabinowitch (Berlin).

Professor Calmette read a most interesting paper, of which the following is a short *résumé:* (1) That there was no morphological distinction whereby we could differentiate the human from the bovine bacillus. (2) That culture methods give a useful indication as to whether the bacillus is bovine or human, but that their cultural characteristics are not sufficiently constant to enable a definite diagnosis to be made. (3) The inoculation of various animals, such as rabbits, goats, and especially bovines, is at once the best method and of general application. In most cases the human tubercle bacillus is unable to infect the rabbit, even if the latter be inoculated with as much as 1 mg. of bacilli from a fresh culture; 50 mg. of bacilli from a similar culture will not generally induce tuberculosis in cattle. If the udder of the goat be inoculated with a culture of the human bacillus, there only results a local infection which at most merely involves the neighbouring gland; whereas the bovine bacillus similarly inoculated will induce an extensive and lethal infection. If 1-100 mg. of bovine bacilli be injected intravenously into the rabbit, the animal develops generalized tuberculosis in the course of four to eight weeks. There can be no question, therefore, that the bovine bacillus is more lethal than the bacilli of the human type, when the latter is isolated from the sputum or from the lungs of a tuberculous subject. Guinea-pigs, cats, pigs, and most animals which suckle their young, are more sensitive to the bovine than to human bacillus. The one exception is the monkey, which shows sensibility to both types of bacilli. (4) Experiments made with a view to raising the virulence of the human tubercle bacillus to such a degree that it is capable of inducing a general and lethal infection in the bovines have yielded uncertain results. Yet, according to Eber, it is possible for certain bacilli of the human type to adapt themselves to the bovine organism, and they then show all the characteristics of a very virulent bovine type. (5) In the early years of life human beings may be infected with bovine bacilli. At *post-mortem* examinations on

children who die of generalized tuberculosis, it frequently happens that the bovine bacillus is found in the infected glands. According to W. Parker, it appears that from the ages of 0 to 5 the percentage of cases due to bovine infection in proportion to the total number of cases of tuberculosis is 26.5 per cent., at the ages of 5 to 16 it is 25 per cent., while above the age of 16 it does not exceed 1.31 per cent., as out of all fatal cases of tuberculosis above this age 98.69 per cent. appear to have been due to the human tubercle bacillus. In chronic cases of pulmonary tuberculosis this latter bacillus is practically alone present. It may be asked whether the rarity of the bovine bacillus in pulmonary tuberculosis is not due to the fact that the bovine bacillus implanted in the organism during the early years of life, without producing a pulmonary infection until after the lapse of many years, has not actually slowly adapted itself to the human organism, and is thus transformed into the human type. Such a hypothesis is supported by Eber's attempt to transform the human bacillus into one which showed the virulence and characteristics of the bovine type. Up to the present, however, there is no satisfactory solution to the question. (6) It is certainly an undeniable fact that in children from 0 to 16 years 75 per cent. of the cases of death from tuberculosis are due to the human bacillus, and in adults above 16 years of age 98.69 per cent. of fatal cases are due to the human bacillus. From the foregoing it is clear that for the prevention of tuberculosis we must prevent the infection of man, and, above all, the infection of the family, this without neglecting measures to protect children against a possible infection from milk. He considered that the principal source of danger to human beings was that they should occupy the same room as a patient with open pulmonary tuberculosis, as this frequently results in massive infection to which the best protected organism almost always succumbs.

Professor Kossel presented the view of the German workers, and he practically upheld the position taken by Koch, although he admitted that a small percentage of cases did occur. Professor Woodhead, of Cambridge, in an excellent paper, reviewed the work and conclusions of the Royal Commission in England, and showed conclusively that about 20 per cent. of tuberculosis occurring in children was the result of infection by bovine bacilli.

Dr. Nathan Raw, of Liverpool, followed, and as the result of his own work and experience supported the British view as to the amount of tuberculosis which was conveyed from animals to man. His conclusions are as follows: (1) It is not possible to accurately distinguish between bacilli of the human and bovine types by microscopical examination. (2) The cultural characteristics are not constant, although, as a general working rule, it is possible to recognize the different cultures. (3) The virulence of the different bacilli varies enormously, causing mild or severe reactions when injected into animals. (4) A large amount of tuberculosis in children under the age of 12 years is directly caused by bovine bacilli from milk. I estimate in Great Britain this amount to be about 15 per cent. of all cases. (5) In those

countries where milk is not boiled the amount of surgical tuberculosis in children is greater. (6) With the rigorous inspection of dairy cattle the amount of surgical tuberculosis in children in Liverpool during the last ten years has, in my own hospital experience, been reduced by about 35 per cent.

The result of this discussion was, so far as any agreement was concerned, of an abortive character, and it was decided to hold a private meeting of those who took part in the discussion with a view of coming to some conclusion. This meeting was held on the following day, with closed doors, and was presided over by Professor Calmette. Professors Kossel and Neufeld firmly upheld Koch's view, whilst the British representatives, Woodhead and Nathan Raw, strongly urged the importance of the danger of bovine infection to man. At the close of the discussion it was unanimously agreed to adopt the following resolutions: (1) Prophylaxis of tuberculosis must principally be directed against the suppression of contamination from man, and principally in the family. (2) The contamination of man by bovine infection is of less frequency; nevertheless, it is necessary to maintain all measures against infection of bovine origin.

These resolutions were adopted unanimously, and it is believed that as a result the stringent measures to eradicate tuberculosis from dairy cows will be continued. It must be admitted that the result of these deliberations is most satisfactory, as there could be no doubt that the danger of bovine infection is now being widely recognized, the only difference of opinion now being as to the *amount* of such infection. These results were accepted by the Conference, and on being submitted to the full Congress in the following week were also unanimously adopted as the finding of the International Congress, which is a matter of supreme satisfaction to the British representatives.

Specific Treatment.

The other work of the Congress was mainly centred on specific treatment of tuberculosis, and various speakers emphasized the importance of tuberculin. It was generally agreed that tuberculin was a most valuable remedy in the treatment of all forms of tuberculosis, but that its administration must be in the hands of careful and competent physicians, and that the case in which it is given must be carefully selected.

Sanatorium Treatment.

The work of the sanatorium was generally praised, and it was agreed by practically all the delegates that the results obtained in a well-equipped sanatorium, combined with tuberculin, were the best that could be obtained at the present time. The results of treatment were increasingly good, and it was strongly emphasized that the key to the situation in the treatment of tuberculosis was early recognition of the disease and prompt and prolonged treatment.

THE SOCIAL CONFERENCE.

The British and American delegates were entertained to tea in the beautiful gardens of the British Embassy, and the British Ambassador, Sir Ronnel Rodd, graciously assisted by Lady Rodd, did all in their power to make the visit to Rome pleasant and successful. Their Majesties the King and Queen also received in private audience a few of the delegates representing the different countries. Altogether the Congress, although not by any means of a memorable or outstanding character, did good work, and demonstrated the extraordinary amount of interest and enthusiasm which is being taken throughout the civilized world in the suppression of tuberculosis.

Reviews.

Springtime Surgery. Edited by Dr. D. M. Campbell, D.V.S., Chicago. Pp. 163. Price 5s. Second Edition, revised and enlarged. Published by the Editor of the *American Journal of Veterinary Medicine*, Chicago, U.S.A.

This little brochure consists of a collection of selected articles or essays upon purely clinical and surgical subjects, and the only fault we have to find with the book is that it is not larger.

Records of actual cases, the mistakes as well as the successes, are always read by practitioners, for they are to them the means by which they get their daily bread, and the successful issues of their cases must of necessity be the subject upon which they concentrate their attention the most. It has been a good idea on the part of Dr. Campbell, the author of "Springtime Surgery," to get together a collection of such cases, and that the book has been much appreciated is shown by the fact that a second edition is stated in the Preface to have been asked for within thirty days of the publication of the first.

The contents include eight articles on castration, accidents and complications, including detailed destriptions of the cryptorchid operation and upon a monorchid and an hermæphrodite respectively; two articles upon ovariotomy (one in heifers and the other in cats); several obstretic and uterine cases, and a number of other interesting clinicals, all described in clear detail.

A Guide to the Dissection of the Dog. By O. Charnock Bradley, M.D., D.Sc., F.R.S.E., M.R.C.V.S., Principal of the Royal (Dick) Veterinary College, Edinburgh; and Lecturer on Comparative Anatomy in the University of Edinburgh. Pp. 241, 69 illustrations. Price 10s. 6d. net. Published by Longmans, Green and Co., Paternoster Row, London.

Professor Bradley's guide to the dissection of the dog will be of greatest service to the veterinary student, and cannot fail, too, to

have a direct influence in stimulating further research into the domains of canine medicine and surgery.

Until a few years ago the study of the dog as a patient was much neglected, but nowadays quite a large number of practitioners make canine practice a speciality, and the owners of dogs flock to their consulting rooms at stated hours. Any book, therefore, which tends to increase knowledge in this direction must be welcomed, and Professor Bradley's work has been issued at an opportune moment; especially as at the present time the Council of the Royal College of Veterinary Surgeons has under consideration the question of the revision of the educational syllabus.

Unfortunately, canine work has not been taught as thoroughly in the past as it will be in the future, and in the dissecting room the dog has very often been treated merely as as casual adjunct, and not as a prospective patient of considerable importance. In reality the anatomy of the dog is as important for surgical purposes as that of the horse, probably really more so, and there can be no question but that Dr. Bradley's book will be *the* dissection text-book of the future on this subject in all British and American veterinary colleges. Every student should have it, and every practitioner and comparative anatomist will find it a useful adjunct to his bookshelf as a standard work to refer to. The illustrations are excellent, and the printers have done their part in up-to-date style. The nomenclature may, for the student, require a little explanation at first, as veterinary anatomical nomenclature still requires to be put upon a universal basis. The one adopted by Dr. Bradley is the Baden and Stuttgart modification of the B.N.A. of the human anatomist. It is the easiest for comparative purposes.

Surgical and Obstetrical Operations. By W. L. Williams, V.S., Professor of Surgery and Obstetrics in the New York State Veterinary College, Cornell University, U.S.A. Published by Carpenter and Co., Ithaca, N.Y. Pp. 240 with 40 plates in the text. Third Edition, revised and enlarged.

Professor Williams' name is so well known to the English-speaking members of the veterinary profession (and, indeed, to our foreign colleagues as well), on account of the recent discussions which have taken place in connection with the verticle stripping operation for "roaring," that it will be no surprise to see that his text-book on surgery has already reached a third edition.

Having its origin as a translation from the German of a small text-book by Dr. W. Pfeiffer in 1900, Dr. Williams issued an edition of his own on similar lines in 1903. This rapidly ran out, and a second and larger edition followed in 1906, to be followed by the present issue (the third edition) now.

It is a most useful book, and one which neither student nor practitioner can afford to do without. For the benefit of the former considerable pains have been taken by the author to describe in detail the surgical anatomy of the parts involved, and the value of this has in many instances been supplemented by illustrations in the

text. For the busy practitioner who wishes to "brush up" his knowledge before commencing an operation it will be found to give just what is required in concise and clear terms. Considerable extension and revision has been made, especially in the chapters devoted to the facial sinuses and the operation for "roaring."

Embryotomy and obstetrical operations are dealt with in some thirty pages whilst a similar space is given to the various neurectomies. Resection of the lateral cartilage, of the flexor pedis tendon and other foot operations, both of horses and cattle, are fully explained, as are the different tenotomies and amputations. If any fault may be found with the author it lies in the fact that, except in the chapter on ovariotomy, he has totally ignored even the every-day surgical operations of the dog and cat. Let us express a hope that this may be remedied in a later edition, for these animals certainly must not be forgotten or ignored in days when the horse is being fast displaced by the motor-car. There are, too, some operations upon the sheep and pig to which a few pages might be given to make the work as comprehensive as the title of the book implies.

Meat and its Inspection. By Arthur R. Littlejohn, M.R.C.S., L.R.C.P., M.R.C.V.S., D.P.H. A Practical Guide for Meat Inspectors, Students, and Medical Officers of Health. London: Baillière, Tindall and Cox. 10s. 6d.

The first four chapters of this book are devoted to the discussion of the methods of slaughtering animals, dressing carcases, preserving meat, to the appearances of normal carcases, and to the physiological conditions which render meat unsound. The other six chapters, which are devoted to the subject of the book, deal with the more common pathological changes, emergency slaughter, general and local diseases, parasitic affections and the specific diseases. The remaining chapter, for which 150 pages have been appropriated, constitutes almost one-third of the whole book, and consists of verbatim copies of, and abstracts from, Public Health Acts, Orders under the Contagious Diseases (Animals) Act, Regulations, &c., which bear a relation to meat inspection and the work of an inspector.

In his preface the author does not claim to have produced a text-book on the subject, but rather an aid to those who have to deal practically with the subject, such as meat inspectors and students for the Diploma in Public Health. As an introduction to the subject, and as an aid to lay inspectors preparing for examinations in meat inspection, the book will doubtless be found to serve a useful purpose, but we do not think that it will meet the requirements of professional students, medical or veterinary. The author has attempted to cover practically the whole field of meat inspection in a very limited space, and the inevitable result of this attempt to condense has been to convey an impression of superficiality; it has also led to errors of omission. With advantage, much of the space devoted to the laws and regulations relating to meat inspection, &c., might have been devoted to the subject proper of the book.

There are not a few inaccuracies in the text, thus we are led

to believe that anthrax is always septicæmic in the pig, that the causal agent of contagious bovine pleuro-pneumonia has not yet been discovered, that Texas fever (bovine piroplasmosis) does not occur in British cattle. Balbianiæ (the name has almost fallen into desuetude) are described as "parasites somewhat larger than sarcocysts," whilst the descriptions of the micro- and macroscopic appearances point to a want of personal familiarity with the parasites. It is unfortunate that these and similar inaccuracies have been allowed to appear in a book which on the whole has been written with clearness and lucidity of expression.

The work of the publishers has been done in their usual commendable manner.

A. G.

Miscellaneous.

UNIVERSITY OF LONDON.

THE following title has been conferred on a Teacher of the University:

Sir John McFadyean (Royal Veterinary College) Professor of Veterinary Pathology and Bacteriology in the University of London.

PRELIMINARY EXAMINATION IN VETERINARY SCIENCE FOR INTERNAL AND EXTERNAL STUDENTS.

PASS LIST, *July*, 1912.

3951. Bosworth, Thomas John, Royal Veterinary College.
3953. Métivier, Harry Vincent Mercer, Royal Veterinary College.

Examiners: Inorganic Chemistry: J. A. Gardner, Esq., M.A.; Professor H. Jackson, F.C.S.; J. E. Marsh, Esq., M.A., F.R.S.; and John Wade, Esq., D.Sc. Physics: J. H. Brinkworth, Esq., B.Sc.; G. W. C. Kaye, Esq., D.Sc., B.A.; A. W. Porter, Esq., B.Sc.; and Professor F. Womack, M.B., B.Sc.

INTERMEDIATE EXAMINATION IN VETERINARY SCIENCE (PART I) FOR INTERNAL AND EXTERNAL STUDENTS.

PASS LIST, *July*, 1912.

3961. Andrews, Francis John, Royal Veterinary College.
3962. Easom, Robert William David Calladine, Royal Veterinary College.
3964. Stainton, Fredrick Harold, Royal Veterinary College.

Examiners: Organic Chemistry: J. A. Gardner, Esq., M.A.; Professor H. Jackson, F.C.S.; J. E. Marsh, Esq., M.A., F.R.S.; and John Wade, Esq., D.Sc. Biology: R. Assheton, Esq., M.A.; F. E. Beddard, Esq., M.A., D.Sc., F.R.S.; W. G. Ridewood, Esq., D.Sc.; and A. Malins Smith, Esq., M.A. Veterinary Anatomy: O. C. Bradley, Esq., M.D., D.Sc., M.R.C.V.S.; and E. S. Shave, Esq., M.R.C.S., L.R.C.P., M.R.C.V.S.

Translations.

THROMBOSIS OF THE FEMORAL ARTERY TREATED WITH FIBROLYSIN.

By M. REICHENBACH.

Leipzig.

In June of this year I was called to attend a horse at a carriage builder's in Plagwitz. According to report the animal went all right at light work but on severe exertion lameness was pronounced on the off hind leg, and on further trial became so accentuated that the animal collapsed on the limb, and could not proceed further.

On arrival I found a seven-year-old, well-nourished Belgian chestnut gelding. He showed no lameness at a trot. For the object of further examination I kept him trotting, and after about five minutes saw slight lameness of the off hind leg, and after another five minutes he became so lame that he could not progress.

The right thigh was quite cold. No pulsations could be felt at the arteria metatarsea lateralis and the arteria digitalis, but in those of the left leg there was strong pulsation. On a further examination per rectum no abnormality of the vessels in the pelvic region could be felt.

After the animal had rested quarter of an hour he could move forward without difficulty.

I made a diagnosis of thrombosis of the femoral artery ; gave the owner no hope as regards the course of the disease, and asked his consent to experimental therapy with fibrolysin, to which he agreed.

On the next day I injected 10 grm. of fibrolysin intravenously. Further, I advised that the horse should be harnessed again after two days and his work gradually increased.

Eight days after the injection the owner informed me that even after continuous hard work the horse only went slightly lame. I thereupon injected a further 10 grm. of fibrolysin intravenously, and two days after the horse went perfectly sound at continued hard work.—*Berliner Tierärzt. Woch.*

CHRONIC CATARRH OF THE EAR IN THE HORSE.

By S. SINGER.

Army Veterinary Surgeon, Brasso.

Last year the horse "Falstaff," of the second battery in my regiment, was brought to me showing considerable motor disturbance. I was told that it was difficult to bring him out of his stall and that each time the attempt was made he dragged the straw with him and stumbled about. Actually in the standing horse instability was evident, whilst the head was held obliquely, and also both off legs advanced cautiously and gropingly. At the trot the danger of stumbling was not wholly absent.

I examined the head of the animal and noticed an evil-smelling

discharge from the right ear. In the external ear passage there were large quantities of a coffee brown greasy excretion. I removed it, cleansed the external ear as far as possible by syringing and washing out with lukewarm water, and then filled the ear up to overflowing with glycerine. On the next day the ear was again syringed out with lukewarm water, and filled with hydrogen peroxide solution. This treatment was continued for fourteen days, and resulted in almost complete cure. Since after ceasing treatment slight motor disturbance again showed itself, I ordered the ear to be regularly rinsed out with 1 in. 1,000 formalin solution at intervals of three to four days, and this was continued for a whole year. Thus the horse remained quite workable. Even now the ear has to be cleansed from time to time, as complete cure has not been brought about, but the discharge is so minimal that the injections are only used once a month. If left for a longer period the head is held slantingly, but motor disturbance has no longer been noticed.—*Oesterreichische Woch. für Tierheilk.*

TREATMENT OF DISTEMPER IN THE DOG WITH SERUM (D.W.).

By H. HOLTERBACH.

Frankfurt-Sachsenhausen.

The therapy of distemper has ever been on the weak side in veterinary medicine. Connected with this is the fact that distemper is a "clinical unit," an infectious disease due to a single specific cause, which declares itself very variedly in its effect on the most varied organs of the body. But for long generations the different forms of distemper have been treated as distinct diseases and consequently notwithstanding many experiments during the last decade no success has been reached in discovering a "specific against distemper." There is none. One cannot treat ætiologically and clinically, like a model, such fundamentally different ailments as those which constitute the collective conception—"distemper." Serum therapy also, which commends itself, cannot be regarded as wholly specific, but may however produce quite a certain effect.

It is self-evident that one cannot come to this conclusion, and he who expects to cure all the different distemper affections from the skin pustule to meningitis with any distemper serum is quite illogical, and distemper sera so irrationally employed is bound to result in many failures.

The serum D.W. used in the cases mentioned here is produced from a streptococcus and a micro-organism similar but not identical with the streptococcus, which has been produced pure by Dassonville and De Wissocq. It was found by both Frenchmen always to be the cause of the fatal pneumonia of distemper, and in no case of death from this complaint was it missing. Consequently the serum here mentioned is primarily recommended as a protective against the fatal pneumonia of distemper. The minimal dose for a single inoculation

is 4 c.c. This dose is sufficient for a protective inoculation and may be sufficient for a curative one. Whether this is so is a matter for the judgment of the practitioner. If this dose does not produce a plain and lasting effect within twenty-one hours (in severe distemper within twelve hours), then it must be repeated and eventually in double the dose if the condition gets worse. The dose is to be given daily until plain improvement sets in. Where failure occurs, the injection is given at too long intervals or is discontinued because no effect results. When a practitioner gives a dog calomel and no laxative effect occurs, he repeats the medication in ascending doses until a result is produced ; with distemper serum he hardly ever makes this consideration.

Useful literature about serum D.W. is still wanting. In order to supply some of this the reports of fifty-nine veterinary surgeons are recorded here. The bad and good reports are enumerated and published without any gloss. The reports consist of :—

(*a*) Unfavourable results.
(*b*) Partly successful results.
(*c*) Favourable results.

Ten veterinary surgeons report unfavourably under section (*a*) and Holterbach's chief comments on their reports are that the serum was not injected in sufficient quantity or with due regard to the necessities of the cases, or else that the patients were candidates for death when first seen.

Five veterinary surgeons report partially successful results under section (*b*).

Drs. S. & W. treated seventy-five patients with 120 injections of serum D.W. and they report: (1) Prophylactic inoculation has always been successful. Not one of the inoculated subjects fell ill of distemper, although they continuously cohabited with infected dogs. (2) A timely use of serum D.W. at the commencing stage of the catarrhal form of distemper almost always results in certain cure ; generally only one to two injections are necessary. (3) Unfavourable results were noticed in those patients in which the distemper had reached a high degree of development (candidates for death). In spite of three consecutive injections no improvement occurred. Here the commencing dose might well have been doubled or trebled, and a longer continuance of the treatment observed ; especially in valuable dogs, three injections are quite too few. (*c*) No success was obtained in any of the nervous forms of distemper.

Twenty-four graduates report (under section *c*) in favour of the injections in a record of over 160 cases treated. One veterinary surgeon, Dr. K., in N., treated fifty-two patients with good results. He says " a considerably higher percentage of dogs may be pulled through the disease by use of serum D.W." He advocates not too early discontinuance of the injections, and that the serum be injected daily in gradually ascending doses.

One veterinary surgeon makes the interesting note that in two Newfoundlands, curative inoculation was non-successful, and yet the disease was not severe at the time of the injection. He wonders whether other practitioners have noted the non-effect of the serum in this breed of dog.

Holterbach concludes by stating that the above material suffices to show the value of serum D.W. as a curative and prophylactic means in distemper.—*Tierärztliche Rundschau.*

THE FUTURE OF THE HORSE TRADE.

THOUGH our export trade in horses is not such as to suffer through motor invasion in the same way as that of France, yet the nation may advantageously consider the French method of combating a change of conditions which would dismay a less adaptable and resourceful people.

A good deal of light is thrown on the existing French horse industry, in the course of suggestions on promoting it, as offered by the Vicomte Martin le Grand, in *La Vie Agricole*. Here we learn something about the differences in the requirements of various countries that deal in horseflesh with France. For instance, Germany can supply its own cavalry horses, but it buys annually from France many first-class carriage horses, large draught horses for industrial purposes, and a very large number of small horses of the Ardennes breed for agriculture. Few stallions, and not many mares, are imported, but very many foals, and from two to three thousand geldings.

Belgium, on the other hand, buys annually from France about a hundred stallions, 1,000 mares, and 1,500 geldings. A constant interchange of the Ardennes breed goes on. This race really originated in Belgium. Here also many horses come finally to be slaughtered.

The Russians are great importers of the large Normandy horse and of trotters.

England takes many first-class carriage horses, and sometimes serves as intermediary for America.

Spain and Italy are France's best customers—to the tune of some 3,000 horses annually for each country.

Roumania also counts among the lovers of the French "Anglo-Arab." The United States were among the first buyers of French horses. South America, Brazil, Argentina and Chili are beginning to know the merits of French horses, and Japan buys every year a good number of well-bred horses.

The writer points out that, in new countries where roads are not yet brought up to the standard of automobile requirements, horses will be employed for a long time to come. Therefore, such places as the centre of North America, South America, China, the Cape, the Transvaal, and other parts of Africa should be intelligently catered for.

The patriotic Viscount believes that the horseflesh of France has only to be known to be sought after, so he advises judicious advertisement through French consuls abroad, through conferences and exhibitions, and even through cinematograph shows, &c.

Not a stone is to be left unturned, and if determination is of any avail, the great horse-breeding industry of France and its export trade is not to be allowed to decline, but is to be carried to the uttermost ends of the earth, for all that mechanical traction is rapidly driving out the noble animal from employment in all the great cities of the world.

I. S. C.

Literary Note.

PUBLICATIONS TO BE ISSUED BY THE TROPICAL DISEASES BUREAU, IMPERIAL INSTITUTE.

In November the Tropical Diseases Bureau, which replaced the Sleeping Sickness Bureau on July 1, will commence the publication of the *Tropical Diseases Bulletin*. The tropical and subtropical diseases of man will be grouped in sections, which will be in charge of the following Sectional Editors:—Fleet-Surgeon P. W. Bassett-Smith, C.B.; Lt.-Col. C. Birt, R.A.M.C.; Dr. W. Carnegie Brown; Professor George Dean; Dr. H. B. Fantham; Dr. Edward Hindle; Dr. R. T. Leiper; Dr. David Thomson; Dr. C. M. Wenyon. Groups will be taken also by the Director and Assistant-Director. The *Bulletin* will be under the general editorship of the Director.

Each number will consist of about fifty pages, containing classified summaries of the current literature of the tropical diseases; they will appear as a rule twice a month. The annual subscription price will be £1 1s., post free; single numbers 1s. 6d. Orders and subscriptions should not be sent to the Bureau, but to the publishers, Messrs. Baillière, Tindall and Cox, 8, Henrietta Street, Covent Garden, London, W.C.

The tropical diseases of animals will be treated in a separate publication, the *Tropical Veterinary Bulletin*. This will appear quarterly, from October, and will be in charge of Mr. A. Leslie Sheather, B.Sc., M.R.C.V.S., of the Royal Veterinary College, London. For this the annual subscription price will be 10s.; single copies 3s. Orders and subscriptions to be sent to Messrs. Baillière, Tindall and Cox, as above.

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TRYPANOSOMA RHODESIENSE.

SIR,—In the VETERINARY JOURNAL for June, 1912, you publish an article from "Rhodesian," in which the following words occur: "It is scarcely correct to state that Dr. Stephens, 'working in Liverpool, had just discovered a new sleeping sickness trypanosome,' since the credit belongs to those medical men who, in 1909, investigated the first cases in Northern Rhodesia and placed on record the extreme virulence of the disease."

By "those medical men," "Rhodesian" evidently means Messrs. L. E. W. Bevan, M.R.C.V.S., and Malcolm E. MacGregor, whose article called "Note on the passage of a Human Trypanosome through Domestic Animals," was published in the *Journal of Comparative Pathology and Therapeutics* for June, 1910. This article contains an account of experiments on the Rhodesian strain in about ten animals. The experiments certainly suggest that the virulence of this strain was great, but the authors did not explicitly state that it was greater than the virulence of the ordinary Gambiense strain, and apparently drew no comparison between the two human strains.

The case from which Bevan and MacGregor's studies were made came to Liverpool towards the end of 1909, and was studied by many of us here from that time. We first ascertained a remarkable periodicity in the increase of the numbers of Rhodesian trypanosomes in the patient's blood (*see* R. Ross and D. Thomson, *Proceedings of the Royal Society*, B. vol. 82, p. 411, received May 2, read June 16, 1910); and simultaneously sub-inoculations in many animals showed that this strain certainly appeared to be much more virulent than *T. gambiense*. Even before this, in March, 1910, Dr. J. W. W. Stephens had observed the peculiar posterior terminal position of the nucleus of the Rhodesian strain in animals. The great virulence of the Rhodesian strain was specifically referred to in October, 1910, in the report by one of us to the Advisory Committee for the Tropical Diseases Research Fund for the year 1910 (Colonial Office, Cd. 5514); and was also described in a series of papers by Stephens and Fantham (*Proceedings of the Royal Society*, B. vol. 83, pp.

28-33, Nov., 1910); Warrington Yorke (*Annals of Tropical Medicine*, vol. iv, No. 3, December, 1910); and Fantham and J. G. Thomson (*Proceedings of the Royal Society*, B. vol. 83, p. 206, Jan., 1911). The morphological peculiarities of the parasite were first publicly suggested as justifying a specific difference by Dr. Stephens on page 56 of the Report of the Advisory Committee just referred to. The full description of these peculiarities, namely, that among the short or "stumpy forms some have the nucleus at the posterior (non-flagellar) end," and that among these, trypanosomes occur with "the nucleus actually terminal and posterior to the blepharoplast," was given by Stephens and Fantham in the *Proceedings of the Royal Society*, B. vol. 83, just referred to, and the name *T. rhodesiense* was proposed for the species.

No further paper from Bevan and MacGregor on the subject is known to us; but Mr. Bevan alone published another article called "Notes on the Human Trypanosome of Northern Rhodesia" in the *Journal of Tropical Medicine and Hygiene* for January 16, 1911, the article also appearing, without illustrations and with a slightly changed title, in the VETERINARY JOURNAL for January, 1911. In these two articles Mr. Bevan says that "the endeavour has been made to classify the parasite by careful study of its morphology, but up to the present no features have been detected which would justify one in differentiating it from *T. gambiense*." In the same articles he says, with regard to the short forms, that "the macronucleus is round or slightly oval, and is situated centrally or slightly posterior to centre." The first remark proves that he did not even then consider that the Rhodesian trypanosome is of a different species from *T. gambiense;* and the second remark, referring to the position of the nucleus, was published some months after the point had been fully discussed by Stephens and Fantham.

We have seen no other articles on the subject by Mr. Bevan during 1910 and the early part of 1911, and no others are mentioned by "Rhodesian." The dates of publication given by "Rhodesian" at the top of page 321 of your Journal are too early by a year, and indeed do not agree with his own foot-note.

From these facts it appears that the original article by Bevan and MacGregor, published in June, 1910, drew no distinction whatever between the *Rhodesiense* and *Gambiense* strains, but merely described a few experiments on the passage of the former through some animals. Mr. Bevan's second article was not published until January, 1911—that is, some months after the various differences between the two strains had been already carefully described by a number of other workers. We may also point out that, even in this later publication, Mr. Bevan mentions only the slightly posterior position of the nucleus (which is not absolutely distinctive), and does not even refer to the *terminal* posterior position which is *the* distinctive difference first noted by Dr. Stephens. Moreover, in this later publication he actually denies that there is any morphological difference at all.

Under these circumstances it cannot be admitted that the credit

of discovering this new trypanosome belongs to the gentlemen referred to by "Rhodesian"—although we wish heartily to congratulate them on the good work done by them. We think, however, that "Rhodesian" would have been better advised if he had attached his name to his article.

Yours faithfully,

RONALD ROSS,
Professor of Tropical Medicine,
H. B. FANTHAM,
Parasitologist.

Liverpool,
June 28, 1912.

[This letter should have been inserted in the August issue, but was unfortunately overlooked.—EDS. V.J.]

Letters and Communications, &c.

Mr. F. Bullock; Mr. R. Branford; Mr. G. Wacher; Dr. C. Troester (Berlin); Mr. Willis; Mr. G. Dunlop Martin; Dr. Fantham; Mr. J. W. Hayes; Mr. Grasby.

Books and Periodicals, &c., Received.

Journal of the Royal Army Medical Corps; Recueil de Médecine Vétérinaire; L'Hygiène de la Viande et du Lait; Revue Générale de Médecine Vétérinaire; Der Tierarzt; Zeitschrift für Veterinärkunde; Berliner tierärztliche Wochenschrift; Osterreichische Wochenschrift für Tierheilkunde; La Clinica Veterinaria; Revista de Medicina Veterinaria; Board of Agriculture and Fisheries; Department of Agriculture and Technical Instruction for Ireland; Kennel Gazette; Agricultural Journals for the Union of South Africa and for Rhodesia; Williams's Surgical and Obstetrical Operations; The Food Inspectors' Encyclopædia; Spring-time Surgery (D. M. Campbell, D.V.S.); Revista Zootéchica; Manual of Poisonous Plants (Pommel); Dissection of the Dog (Bradley); American Journal of Veterinary Medicine.

NOTE.—All communications should be addressed to 8, Henrietta Street, Covent Garden, London, W.C. Telephone, 4646 Gerrard. Telegrams, "Baillière, London."

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